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BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE
AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

> OUR readiness to overlook the primary importance of industrial efficiency to a democracy constitutes the cardinal difficulty in dealing with the American Labor problem—ARTHUR T. HADLEY, *Economic Problems of Democracy.*

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29 W. Thirty-Ninth St.
New York

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BULLETIN OF THE
TAYLOR SOCIETY
AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

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Comment

THE January meeting ranked with the best of earlier meetings in the value of its papers and discussions, and in addition displayed a quality unusual in society meetings. That quality was a fervor which appears to have been the outward manifestation of two things: a feeling of gratification in the past accomplishments of Scientific Management as related in the papers and discussions, and a feeling of confidence in its future inspired by the very frankness of the discussion of Scientific Management's shortcomings in the past. It was a fervor which proved the value of the policy of standing for something definite.

THE general theme of the meeting had been announced as an appraisal of the achievements of Scientific Management during the past decade; and as one paper after another presented details of these achievements—in general administration, in industrial relations, in the conduct of public business, in other countries than the United States—the conviction grew that the work of the Taylor Society rests upon a solid foundation of idealism and practicality proved by experience, that no matter what the shortcomings may have been, the movement shows an irresistible forward surge. As one speaker put it: "It was absolutely necessary during Mr. Taylor's lifetime for him to battle in and out of season not only for the maintenance of broad principles but quite as much for the scrupulous observance of details—some of them seemingly quite unimportant. By means of a fine mind, broad sympathies, a wide range of knowledge, a willingness to spend and be spent, a never-suspended unwillingness to compromise, and by other means, he built up an integrated philosophy of work adequately expressed at many places by appropriate mechanisms. In the face of opposition from a thousand quarters he made this demonstration. The world accepted his thesis as much as it ever accepts the work of innovators. And then the Great War came and we saw all that Mr. Taylor stood for in production proved out on a gigantic scale. Opposition to Scientific Management rightly conceived is no longer heard in responsible quarters."

CONSIDERATION of shortcomings usually produces discouragement when unaccompanied by consciousness of a reasonable measure of positive achievement. It is only when there is consciousness of positive achievement that consideration of shortcomings has the value of arousing that type of emotion which incites to resolution and action. The recital of shortcomings of Scientific Management at the January meeting was frank and full. It began with the first paper of the first session and ended only with the last discussion of the final session. Yet so gratifying was the accompanying recital of constructive achievements that statements of shortcomings were received with what might almost be called enthusiasm. They seemed to be accepted rather as challenges than as criticisms; some of them simply challenges to a more precise formulation of mental attitudes and statement of methods in practice—as with respect to workers' participation in management under Scientific Management; some, challenges to greater cooperative activity with other organic elements in industry—as with organized labor; others, challenges to new lines of cooperation in investigation—such as study of the psychological elements in management.

THE most striking single feature of the meeting was the manifest interest in psychology as related to management, displayed at the Friday forenoon session. Evidence of that interest was called forth by John Williams' discussion of "Scientific Management and General Administrative Control," of which the latter part was a consideration of management's vital concern with psychology, because management is primarily the direction and supervision of individuals in cooperative activity. Mr. Williams departed from his usual custom—the reading of a paper almost mathematical in its precision—and "just let himself go" with the aid of brief notes. The result was an argument driven home by personality plus. The applause which followed was prolonged, a motion was carried which thanked him for a "significant" address, and a resolution was passed "that the Society recognize psychology as a major phase of the management problem." In connection with that resolution it was stated by someone that the Taylor Society would be the first management society so to do; but in that there was error. If our recollection is correct, it is on record that at least one other management association has passed a similar resolution; but it is not unlikely that time will prove that the Taylor Society passed such a resolution at the most "psychological moment" in the development of its work. At any rate, letters have been coming in from members who were at the meeting, asking for lists of works on psychology; and the presence at the meeting of an eminent psychologist, who testified that the psychologists are ready to cooperate, assures an understanding on their part of the Taylor Society's desires and mental attitude, which understanding should promote cooperative effort.

UNDER the caption "Why the Taylor Society?" we find the following statement accompanying an exhaustive report of the January meeting, in *Chemical and Metallurgical Engineering*, February 4, 1924:

"Some of our readers may ask this question; and, as the connection between this society's activities and the field of "Chem. & Met." is not at once clear, we wish to call the reader's attention to the reason why its activities are worth study. This is a period characterized by a hard, competitive market—a buyers' market. And the plants that are doing the best percentage business in the country in the face of this market are the scientifically managed plants. Scientific management is a universally applicable philosophy, not a circumscribed mechanism of but narrow utility. It is as helpful to a chemical plant as it is to a machine shop. And where can we better go to find out about it than to that organization, the members of which make it a lifetime study—the Taylor Society?—Editor."

Fondation Michelin

FOLLOWING is a translation of an official statement of the objects and activities of the French Committee on Scientific Management founded by M. M. Michelin—*Comité d'Organization Rationnelle* (*Système Taylor*) *Fondation Michelin*:

"M. M. Michelin, convinced of the importance of the new methods of work inaugurated in the United States by Frederick W. Taylor, have decided to contribute annually a considerable sum for the extension of the knowledge of these methods among young French engineers.

"These annual contributions will be in charge of a Committee of which the Presidency has been accepted by M. Le Chatelier, Inspector General of Mines. This Committee will utilize these contributions in such manner as best to secure the results desired. The Committee desires to interest particularly the students of various schools of applied arts associated with l'Ecole Polytechnique et des Ecoles Superiéures (Mines, Ponts et Chaussées, Génie Maritime, Manufactures de L'Etat, Postes et Télégraphes, Poudres et Salpêtres, Artilleries Navale, Ecole Supérieure d'Electricité, Ecole Supérieure d'Aéronautique et de Constructions Mécaniques).

"The funds put at the disposition of the Committee are used principally as follows:

"1. For conferences, to the organization and conduct of which M. M. de Freminville and Nusbaumer, members of the Taylor Society, have volunteered to give their particular attention;

"2. For a library containing French and foreign books, pamphlets and periodicals pertaining to the field of organization and management;

"3. For practical demonstrations of time study methods;

"4. For organized visits to industrial plants having noteworthy methods of organization and management; and eventually for the subsidizing of missions to inspect management methods in foreign countries.

"The Committee aims particularly to promote among young French engineers a knowledge of the best in scientific management practice; to publish syllabi, papers, discussions and reports of missions; to translate the leading foreign books and pamphlets pertaining to management; and to offer attractive prizes to young engineers who make the best reports concerning their observations in visits to industrial plants.

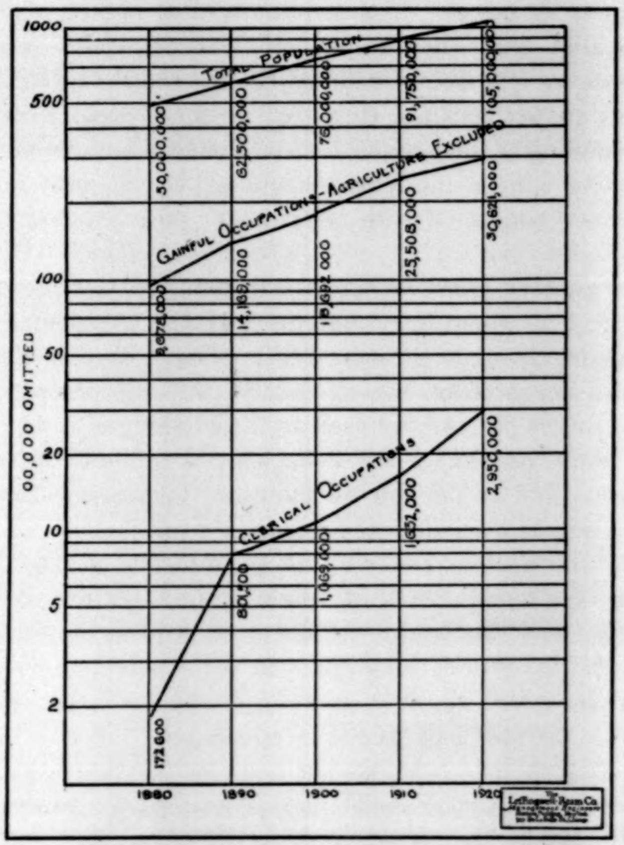
"The results which have been obtained during the five years of the existence of the Committee are highly satisfactory, and it is indisputable that, thanks to the activity of the Committee, a large number of young engineers have been attracted to, and interested in, the philosophy and methods of management developed by Taylor and his associates."

Waste in Office Work

DURING the past forty years there has been a startling growth in the number of those engaged in clerical occupations.[1] As will be seen by the accompanying chart, the actual number of clerks has increased seventeen times, while the number of all "gainful occupations" (agriculture excluded) has increased but little more than three times—from 9,678,000 to 30,621,000. The population during this period has only slightly more than doubled.

If the curves of "gainful occupations" and "clerical occupations" shown on the chart are projected on a line based on the average growth of the past twenty years, the two lines will meet in 1970; that is to say, apparently in forty-six years all occupations will be clerical. This suggestion is, of course, absurd, but the present direction of the curve is sufficiently startling to cause managers to stop and consider, for it may explain in part "where the profits went."

In the eighties began the trend toward modern-scale production and the entry of the United States into the world market for the competitive sale of manufactures, and it was then found that by the addition of clerical, or so-called "non-productive" labor, the productivity of the remainder of the workers could be increased. This accounts to a large degree for the big jump in the figures between 1880 and 1890. From that year to 1900 there is a lag in the curve, but in each subsequent decade there is a decided rise. What is the explanation?



Comparative Rates of Increase of Clerical Occupations

No doubt there are some who will assert that the modern methods of factory production control are responsible, and who will blame Scientific Management for the rapid increase of "overhead." But those who do so are without a knowledge of the facts. In the first place a lamentably small percentage of businesses are scientifically managed, therefore this could not possibly account for even a small part of the increase. In the second place, that increase is by no means confined to clerks in processing departments of manufacturing plants. For example, there were in 1880 but 10,000 bookkeepers, accountants and clerks in all banks in the United States, while today there are over 30,000 banks in the country, and half a dozen large New York banks have in excess of 1,000 clerks each. By far the largest increase has been in sales and sales promotion, and financial and commercial activities.

One or two examples that came recently under my observation illustrate this. In one scientifically managed office with three hundred clerks, only 16 per cent of them are connected with the works management, and the ratio is about one such clerk to ten employees in the works. This ratio is larger than might be necessary in other lines, because the processing of this business is largely of a semi-automatic nature, and compared with the output but few employees are necessary. Of the remaining 84 per cent of clerks, about 16 per cent are employed on the clerical work of handling orders, 18 per cent on financial and administrative control, and the remaining 50 per cent on activities connected with advertising, sales promotion and sales.

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[1] Desk workers, etc.; not sales persons.

In another plant there are one hundred clerks, 30 per cent of whom are connected with the works management, the ratio of such clerks to employees in the works being about one to twenty. Of the other 70 per cent, 15 per cent are used on the handling of orders, the same percentage on financial and administrative control, and 40 per cent in sales and sales promotion. This also is a scientifically managed plant.

In still another concern, not scientifically managed, there are ninety clerks of whom 10 per cent are connected with the works management, a ratio of about one clerk to forty employees in the works, observation of which shows that more clerks could be employed in this department to advantage. Of the remaining 90 per cent, 20 per cent handle the orders, 10 per cent the financial and administrative control, while 60 per cent are devoted to the advertising, sales promotion and sales.

In my opinion, however, the sudden growth of clerical help is not necessarily due altogether to new uses that have been discovered for clerks, but rather to the incontestable fact that the office is at present the most poorly controlled function of business. Practically all the attention of the really capable executives in most organizations is devoted to production, finance or sales, and they have no time and little respect for the office. Nevertheless, statistics seem to suggest the startling possibility that this disregarded function, unless speedily brought under effective control, may ultimately devour the profits of all business.

In one of the examples above noted we discovered ten file clerks employed to file matter that could easily be filed by four well-trained clerks; indeed, it is questionable whether it is necessary to file all the material, for investigation showed that 25 per cent of it was of but temporary value. In another case, thirty-six stenographers were found who wrote a daily average of four letters each. And both these instances were in plants which were supposedly operated scientifically —where works operations were nearly perfect and enormous salaries were paid to managers of the sales and financial functions. The office manager was comparatively a low salaried and unimportant executive.

Though to some extent exceptional, these are not isolated examples—they can be duplicated many times. There is unquestionably a very large wastage of human productivity in the office.

Mechanical equipment and systems have been developed to a very high degree in the office, but control, even in the best of them, is lamentably inferior to that in other functions of business. Because of this lack of control, we are rapidly developing a group of "workers" in business who quickly become dissatisfied with any job which requires them to give close and sustained application to the work for more than two or three hours a day.

As proof of my assertion of the almost complete lack of control, let each office manager attempt to answer for himself the following three fundamental questions:

1. How many clerical operations are there to perform in my office?
2. How many clerical hours does it take to do the work that there is to be done?
3. How many hours should it take?

My experience tells me that not one in a hundred office managers can answer these three questions. Yet all will agree that control is impossible until they can be answered.

Today, with nearly three million clerks, we have a group that is far larger than any other single occupation. It is larger than the railroad and coal mining groups combined. And as we regard this vast host that assembles weekly for its pay envelopes, do they not suggest something of the lilies that "toil not, neither do they spin, yet Solomon in all his glory was not arrayed"—in white collars, silk stockings or furs?

At the famous railroad hearings in 1910, Harrington Emerson made the statement that the railroads, because of lack of scientific methods of work and control, were wasting $1,000,000 daily. The clerical group in all industries probably receives $10,000,000 a day in salaries, and it is surely a conservative estimate that 20 per cent of this is waste; which leads to the conclusion that because of lack of scientific control of the clerical expenditure for the entire country, there is a daily waste of $2,000,000, all of which can be saved by the establishment of adequate control in the offices.

WM. H. LEFFINGWELL[1]

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[1] Leffingwell-Ream Company, New York.

Taylor the Creative Leader

A Review of Copley's "Frederick W. Taylor"[1] Which is a Critical Analysis of Taylor's Contribution to the Problem of Human Welfare

By **OLIVER SHELDON**

Organization Manager, Rowntree & Company, Ltd., York, England[2]

THE HISTORY of the world is but the Biography of great men," said Carlyle. "For, as I take it, Universal History, the history of what man has accomplished in this world, is at bottom the history of the Great Men who have worked here." In that work of the world every man has his share, and more intriguing than any novel, more emboldening than any romance are the stories of the share which this man or that man has taken. "We cannot look, however imperfectly, upon a great man, without gaining something by him," continued Carlyle; and Frederick Taylor himself echoed the same thought,—"I think no book is more stimulating than the history of a devoted and successful life."

This thought of Frederick Taylor is mine as I read Frederick Taylor's own life.

I turn over the last pages of this book, and, as I read of that simple grave on a hill, above the Schuylkill River, I try to sieze upon my main impression. Through many pages I have followed the growth of a man and of a movement. I have seen childhood, youth and manhood; work and pleasure; difficulty and success; home life and public life, in the story of one man. I stand where this buoyant, restless, indomitable stream runs into the inscrutable sea, and I look back. I trace it from its source in Germantown. I see it widening and deepening as it flows through Midvale and Bethlehem and anon the pleasant greenery of Boxly, till it meets the incoming tide. I try to weld my chasing thoughts into some unifying impression, and it is this—that, in the intimacy which these pages have afforded me, I have been treading a pathway in the rare company of the man who hewed it out—a footpath broadening into a highway which leads on further than the lights of this mortal city of mine. I see a man building a road, and the road outstrips all sight. Some men are great, for the fruits of their work are spread for all the world to applaud. Frederick Taylor is great, for the fruits of his work have yet to be garnered. The potentiality of it all is what strikes me most. The greatness of a man is normally associated with the movement in which he played a leading part. Great as was Frederick Taylor, greater still is the movement of thought which he has inspired.

I have seen a purposeful and tenacious mind toiling, through the hard school of experiment and the clanging uproar of day-to-day living, towards a philosophy of which it was not yet aware; I have seen it boldly developing systems which gave that philosophy an actual, workable life; I have seen it pounce upon the various facets of that philosophy, as the light glinted from the stony surface of reality and revealed a principle; I have seen each facet, each principle fitted into its place, like the pieces of a mosaic pavement—and the philosophy is greater even than the thought of him who pieced the stones together. As the philosophy of Rousseau, in the body politic, was greater than Rousseau, so is the philosophy of Taylor, in the body industrial, greater than Taylor. It is, indeed, the privilege of great men, the pioneers and builders of human thought and progress, to be immersed in the movements which they have originated or furthered.

It is well, however, that we should, from time to time, fight our way back to the original work and constructive effort of those who have done outstanding service in any field of progress, that we may know and admire the source of that which we inherit. For, if a great movement is greater than the life of any who served it, yet does such a life inform the movement with something tangible, and bring it within the compass of every day affairs. No great movement but has its great men, and in their lives are hidden the keys which open the doors of understanding. Philosophies are intangible; men are real. The life of the man brings the philosophy closer to the things we know, gives it substance, makes personal the impersonal. And truly the life of Frederick Taylor, while opening a wonderful vista, in the very ruggedness of its story makes the philosophy essentially work-a-day.

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[1] Harper & Brothers: New York, 1923; 2 vols., $10. This is the first of three reviews which will appear in the *Bulletin*. The others will be by Charles de Freminville, an eminent French Engineer, and Irving Fisher, an eminent American economist.

[2] A. B. Oxford; author of "The Philosophy of Management."

Mr. Copley has achieved a remarkable work. He has faithfully and picturesquely recorded the life of Frederick Taylor, yet at the same time has presented like a panorama, the growth of a philosophy, of which Frederick Taylor was the leading artisan. While he traces the life of Taylor to that stone memorial on a hill, which stands for all that mortal frame endured and conquered, he makes us see the contribution of Taylor to human thought as a stage from which the curtain is but half withdrawn. Of the life, the tale is told; but of the philosophy, the play has barely begun. In this, Mr. Copley has succeeded in an immensely difficult task. Rarely has a man, either in fact or in popular thought, been so closely associated with a movement, as was Frederick Taylor with Scientific Management. Rarely has a man lived to see the growth of definite principles out of his own groping experiments as Frederick Taylor saw the principles of Scientific Management emerging from his work at Midvale and Bethlehem. Rarely has a man lived to bear upon his own shoulders both the praise and the execration accorded to a new movement of thought, as Taylor in his own lifetime did. Rarely have the name of a man and the name of a movement been so readily interchangeable and in fact so actually interchanged as the names of Frederick Taylor and Scientific Management. Yet, in spite of the close and personal relation between the man and the movement, Mr. Copley has succeeded, while treating the man and his work as a whole, in distinguishing between the two, and leaving us distinct impressions of each. The sun of the man has sunk to its inevitable setting, but the sun of his philosophy has but barely broken the clouds in its dawning. To write the biography of such a man is no easy task. It cannot be just the bare record of a man's life and what he did. It must give that, and more, for what he did was not something which ended with himself. The task of the biographer was not only to tell a life-story, but to relate that story to what was yet to follow,—to trace the fleeting life to its premature close, whilst its philosophy was waxing to its springtide. This Mr. Copley has achieved with singular success. He has given us a living picture, with all its lights and shadows, of Taylor, the man; and a wise survey of what Taylor aimed at and achieved, and how his life-work swelled into a mode of thought, which we believe is destined to redirect the whole trend of industrial progress. If the words spoken by a certain gentleman are true of the man—"What Mr. Taylor did was to go out into the works and start a revolution"—they are true also of what Mr. Taylor's philosophy will yet achieve in the whole fabric of industry.

To those who, like myself, have studied Scientific Management from afar, who have not had the opportunity of coming into touch with its pioneers, who have not experienced the rough-and-tumble of its youthful encounters, this book comes as an illuminating story. It has rendered the whole thought of Scientific Management far more intimate and personal. It has clothed it with human form, and brought all the kaleidescopic thought, activity and experiments back to the thought of a man strolling across the sloping lawns, beside the herbaceous borders, under the rose arches and between the box hedges of a garden. This philosophy which I have studied and endeavoured to apply is not now something abstract and theoretical; it is very human. It is a delightfully living medley of time studies and weird golf clubs, of planning rooms and forceful epithets, of minute experiments and amateur theatricals, of tool rooms and of "my little intellectual friend," Putmut the cat. I am glad to think that the chief exponent of Scientific Management was a brilliant tennis-player, a fine gymnast, captain of his Exeter baseball team, and, later on in life, a most stimulating father to two lads. It puts a complexion on Scientific Management which makes me believe in it all the more. It is no longer something imposed on the world out of an ethereal void, but something that has welled up from the work of a man who made his daily trip to the factory and, at night, read aloud "The Lure of the Labrador Wild" to his family . . . .

Indeed, Frederick Taylor seems to have been more normally human in many ways than most men who have left their imprint in history. No man of whom it can be said—and by a lady too—that he "never seemed more of a gentleman than when he was swearing," and who can come out with such sweeping statements as "All Germans are liars," and "You can't introduce economical methods by sitting up and howling," can but be held as a human among humans.

He found public speaking a stumbling block; he wrote with difficulty; mental agility was not his strong point; his swearing, when necessary, was forcible—all features of the people one meets in the day's march. His home life was wholly delightful. His relations with his adopted children—now stern, now mischievous, now tender—tell us of a man to whom fame brought no pride. "He was kept humble by his knowledge of the ability he did not have and the things he did not know. There was much that was wistful in his attitude towards men who spoke familiarly of things upon which he felt he had no light." Despite the strain of his work, despite the opposition he encountered, and despite the increasing reputation which brought him scores of visitors and shoals of correspondence, this man, of whom things both laudatory and damnatory were spoken with unusual vigour, retained a character singularly free from the faults which are associated with fame. Nothing from this outside world could break the serenity of his home. No reports or rumours could disturb the openness of his hospitality, the socialibility of his nature, or his loyalty to and thoughtfulness for his friends. It is not to be wondered at, therefore, that those who visited him should, having come to see the leader of a new movement, have left, admiring not only an able thinker but a manly character. Thus, Mr. Brandeis wrote:

> I quickly recognized that in Mr. Taylor I had met a really great man—great not only in mental capacity, but in character, and that his accomplishments were due to this fortunate combination of ability and character.

And, Rudolph Blankenburg expresses the same dual charm of the man in the eloquent words he delivered at the Taylor Memorial Meeting:

> Mr. Taylor was to me a paradox. On one hand we find his rugged intellect blasting its way through layer after layer of conventions formed by generations of prejudice, tradition and ignorance until he became recognized as perhaps the world's foremost industrial leader. When truth was at stake, he was resourceful, robust and tireless. The problem once even dimly visioned he pursued with the zest of a hunter until he conquered. On the other hand, those whose contacts with him were, like my own, only casual and who went to him as converts, rather than to be converted, could hardly sense his power. He was born and bred to a gentle manner. His sweet smile and courtly bearing were only the surface indications of an innate and broad spreading sympathy and kindliness. He knew he had much to give and he gave it with a generosity which knew no limits.

Mr. Copley has been both faithful and wise in including in this book so much of Mr. Taylor's personal life, as distinct from his work. Character, indeed, plays a leading part in the achievements of a man; how much, I fancy, we sometimes underestimate. Brandeis glimpsed how much the character of Taylor had contributed to Taylor's life-work. Perhaps others in his day would have viewed Scientific Management in a different light had they known the character of the man behind it. How alien to Taylor's character was much that they attribute to Scientific Management! How contrary to Taylor's ethics were some of the motives attributed to the man whom they knew only through the second-hand channels of books, newspapers, rumours and the experiences of others! A downright man, true; an outspoken, often brusque man, true; a strict, exacting, imperious man at times, true; a man, who, having suffered, was perhaps a little intolerant, perhaps a little stinging, true; an impatient, tactless man, maybe. "But, however much he might irritate men, they had a habit of saying: 'Well, you know where you stand with the doggone cuss, anyway' "—and that sentiment is not a tribute either to a great thinker or a great scientist and inventor, but to a commanding character,—a character which flamed with enthusiasm and courage, and bore honesty and a meticulous regard and respect for justice emblazoned on its shield. It was open to men to question Taylor's abilities, if they could find a cranny wherein to fire a shaft, but none could gainsay either the qualities and motives he brought to his work, or the charm and friendliness he displayed openhandedly in his home. Here, indeed, was a man, a chip of common manhood, a wholehearted liver of life.

Like all men who have set in motion or furthered great mental revolutions in the world, however, Taylor brought to his work, not only a high character but also a truly remarkable mental ability. Primarily, his mind had in the highest degree those qualities which we associate with the scientist—critical, inquisitive, thorough, painstaking, logical, tenacious, persistent, constructive. He had preeminently the scientist's passion for truth, the scientist's reliance only on those facts which, by endless experiment and testing, are proved to be true.

> His reputation (said Henry L. Gantt) does not depend upon the fact that he designed and built the most successful big steam hammer in the world, or that he developed a method of treating tool steel that trebled its cutting power, or that he determined the laws of cutting metals, or even that he was the father of scientific management. These were incidents in his career, and only the logical results of his methods. At an early date, he realized how much of the world's work was based on precedent or

opinion, and undertook to base all his actions on knowledge and fact.

In other words, his chief claim to fame, as indeed it was the chief attribute of his mind, was his use of the scientific method and his elaboration of a science for everyday practical things. He was not only a supremely scientific man, but he was bold enough to apply his scientific mind to things for which it was little thought a science could or should exist. As Mr. Copley points out, he thus anticipated a subsequent prophecy made by Mr. H. G. Wells, when he wrote, in one of those delightfully interpolated reflections with which he is wont to add to the fascination of his novels:

> When the intellectual history of this time comes to be written, nothing, I think, will stand out more strikingly than the empty gulf in quality between the superb and richly fruitful scientific investigations that are going on, and the general thought of other educated sections of the community. I do not mean that scientific men are, as a whole, a class of supermen, dealing with and thinking about everything in a way altogether better than the common run of humanity, but in their field they think and work with an intensity, an integrity, a breadth, boldness, patience, thoroughness and faithfulness—excepting only a few artists—which puts their works out of all comparison with any other human activity . . . . In these particular directions the human mind has achieved a new and higher quality of attitude and gesture, a veracity, a self-detachment, and self-abnegating vigor of criticism that tend to spread out and must ultimately spread out to every other human affair.

Taylor himself realized something of the novelty of his work in this sense, when, in 1912, he said: "A very serious objection has been made to the use of the word science in this connection (that of management). I am much amused to find that this objection comes chiefly from the professors of this country. They resent the use of the word science for anything so trivial as the ordinary, everyday affairs of life."

Taylor, indeed, must rank among the greatest of scientists for, not only did he prove himself an incomparable exponent of the scientific method, but he built, on the basis of his research, a new science, and a science in a new field, far from the laboratories of the universities, where the clangour and smoke of factories strike the air, and men dig and shovel and carry and draw. He made everyday things the subject of thought, and thereby raised them. He lifted the toilsome task of the labourer out of the ruck and muck and "lit it up with a ray from the realm of pure intellect." High tribute, indeed, was it to receive from such a man as Le Chatelier, professor of chemistry in the Sorbonne, the words, "I was somewhat ashamed to find the science of a practical man infinitely more developed than my own . ."

It is strange to think that this man, who began his work in industry on the floor of the Midvale machine shop, who moved from clerk of the shop to work as a machinist, who then became gang boss in charge of the lathes and subsequently became foreman, chief draughtsman and chief engineer successively—this man, who, in his early days, worked from 6:30 to 5:10, who often volunteered to work on Sundays as well as overtime on week days, whose drawings William Sellers flung in the fire, who stopped the daily beer and whiskey wagon driving into the Midvale works—this man, who fought his way from the lowest and lived his life among the hard knocks and rough-and-tumble of the factory, should have, in such surroundings and as a part of such a life, brought to bear on his work a mind so scientific that it has come to command the respect of the whole world of science.

What Taylor achieved, however, could not have been won by a scientific mind alone. There were other mental qualities which contributed to this success. Of these, I should place foremost his determination, persistency, thoroughness, tenacity, and above all, enthusiasm. These are qualities, of course, common to most successful men who have encountered opposition in the pursuit of their ideals. Yet, recurring again, as they do, in the life of Taylor, one cannot but marvel as, at every turn in his life, they loom into prominence. One can quote from this book instance after instance where Taylor, had he been of poorer clay, would have taken the easier road. It may seem a barren field of battle in which to try such highly tempered weapons as Taylor's persistency and thoroughness—this machine shop at Midvale, for example. Yet the story of Taylor's struggle with his men, ending, as it did, in a most solid hold upon them, reads like the yarn of an Arctic explorer. Only infinite determination, inexhaustible enthusiasm and unyielding persistency could have climbed the obstacles which were laid in his path. It was the same throughout his life. Nothing was impossible, if it were necessary. Few men would have won the degree of M.E. when occupied, in the whole-hearted way he was, in the work-a-day toil of the shops. Few men—to take a more domestic incident—would have planned the removal of old box hedges with the thoroughness and disregard for precedent and prejudice with which he undertook it. "We were told," wrote Taylor, "not only by the former owner of the place, but by all the gardeners and landscape architects whom we consulted, that it was an impossibility." Yet, he set to work in his own scientific way to solve this 'impossibility,' as he had solved many another greater one; and, later, one might have seen box hedgerows in huge wooden crates, pulled by horses, running along a wooden track, to their new destination. Where others had failed, Taylor succeeded. It was characteristic of Taylor's whole attitude to things that wanted doing,—whether it was to increase the cutting speed of steel, to ensure the proper care of belting, to learn the content of the shoveler's task, or to elaborate functional foremanship in the Bethlehem machine shops. In big things and small things, there was always the same undaunted persistency and thoroughness, kept going by an enthusiasm, which not only made him a supreme optimist, but drew others along with him. "Why, he would have filled up a corpse with enthusiasm, if only the corpse could hear," said a Midvale executive. His whole work, viewed from this angle, was, indeed, little short of amazing. For years, industry had revolved in the same old way; then, the youth Taylor enters Midvale, and within ten years, not by any great display of mental genius or brilliant discovery, but by sheer drive and tenacity and enthusiasm, coupled with an unfailing belief in and use of the scientific method, this man, between the ages of 22 and 32, set the whole establishment buzzing along lines which had hitherto hardly been imagined. As an example of mental intensity, I know few achievements, whatever the field, to equal it.

In reviewing the mental attributes of Frederick Taylor, moreover, one cannot but refer to those other qualities which formed, as it were, the complement to those we have already noticed. I mean his intensely logical mind, his genius for detail, and his boldness in construction. These were the qualities which enabled him to found his constructive work on fully analyzed bases of fact. In speaking of Taylor's work at Midvale, Carl Barth says:

> He constantly investigated tools and other small appliances that gave minor trouble or fell short of giving entire satisfaction, and in discovering the cause of their shortcomings, was able to effect highly-desirable improvements. Many of these improvements probably could easily have been made by anyone else who had taken the trouble Taylor did to investigate. The basis of it lay in the fact that it was Taylor's genius to recognize the importance of trifles.

To Taylor, nothing was too small or insignificant. It was the little motions, the little adjustments, the little elements which were the basis of his whole philosophy. He realized to the full that, for the average man, invention itself was a question of studying the detail.

> It is thoroughly illegitimate, he said, for the *average* man to start out to make a radically new machine, or method or process, new from the bottom up, or to do things most of which have not already been done in the past. Legitimate invention should be always preceded by a complete study of the field to see what other people have already done.

What Taylor meant by a "complete study" may have differed from what his hearers interpreted it to mean, but to him it meant a study so exhaustive that every detail was laid bare before his microscopic eye. Perhaps what Mr. Copley has entitled, "A Tale of Shoveling," is the supreme example of this Taylor genius for detail, though the work which led up to his discovery of high-speed steel is an equally striking illustration.

> Now, gentlemen (said Taylor in giving evidence before the Special Committee of the House of Representatives in 1911-12) shoveling is a great science compared with pig-iron handling . . . . Under the old system you would call in a first rate shoveler and say, "See here, Pat, how much ought you to take on at one shovel load?" And if a couple of fellows agreed, you would say that's about the right load and let it go at that. But under scientific management absolutely every element in the work of every man in your establishment, sooner or later, becomes the subject of exact, precise, scientific investigation and knowledge to replace the old "I believe so" and "I guess so." Every motion, every small fact becomes the subject of careful, scientific investigation.

Taylor was speaking out of his experience. In describing the method of Scientific Management, he was emphasizing that application to detail which was one of the distinguishing features of his own genius.

As is often the way, this capacity for detail was part and parcel of a highly logical mind. The successive steps which Taylor took in the expansion of his system form a singular picture of lucid, constructive thinking. It is an entire misconception to believe that Scientific Management originated as a theory and that certain mechanisms were subsequently devised for the application of the theory. The story is wholly the reverse. By the singular efforts of a shop foreman to solve his practical shop problems, certain mechanisms were designed and applied, which one by one led on to other mechanisms, each one requiring a further one, till what had grown as need arose became recognized as a system. The system being recognized, there came the final stage of deducing from the specific mechanisms those principles which seemed to be of general application; and thus in the end came a philosophy. It was the logical thinking of Taylor which made the various mechanisms fit into a system. The detailed investigation of machine operations and handling times came first; from this, it was possible to deduce standard methods of operation. Standard methods of operation required, for their continuous performance, standard conditions of working. There were devised, consequently, such mechanisms of management as the Tool Room. But this divided the worker from his implements and materials. A condition of obtaining standard output was the delivery of "the right materials and the right tools in the right condition to the right man at the right machine with the right instructions at the right time." This inevitably led to the development of planning. But how to get the worker to operate correctly? The only way was to supply detailed written instructions; and, in order to have those instructions scrupulously observed, to devise a wage-system which would provide extra wages for following the instructions. Thus, in a series of consequential stages, Taylor came to his functional organization,—looking back, a remarkable feat of logical thinking. As Dr. Person said, when, under his direction the Amos Tuck School made Scientific Management the basis of its instruction in management—"We found that the Taylor System was the only system of management which was coherent and logical, and therefore was teachable."

Of the further quality of inventiveness which Taylor possessed, there is little need to speak. His inventiveness was implicit in his spirit of scientific enquiry. His inventions were not born of revolutionary genius, but of the naked truths which his minute investigations brought to light. His famous steam hammer,—of which Gantt said, "I do not know of any more daring piece of engineering construction"—was not the outcome of what Mr. Copley calls "an egotistic desire to be original, to do great and glorious things," but rather was it the logical consequence of a long and painstaking survey of other steam hammers and of what a steam hammer ought to be and do. But I do not dwell on this, for Taylor's inventive work was due to attributes which we have already discussed.

That there were flaws in Taylor's mental equipment will be readily understood. His abilities were outstandingly those of what we have come to call the "engineering" type of mind—the mind which, "works for the solution of a single technical or engineering problem and is concerned with the determination of the solution rather than the application of that solution to practical activities." As an executive, it cannot be doubted that, despite a high order of ability in management, he had serious defects,—the defects of a man who has thought far ahead of the practice, and is impatient that the practice should catch up; the defects of a man who has probed to the very truth of things and is careless of aught but the truth; the defects of a man who followed where logic led him, and was scornful of the roundabout way of reaching a conclusion. I think, too, we must class among his defects his antipathy (if the word is not too strong) to the "academic" and the "humanities." It is a common fault of practical men, though most successful practical men, unknowingly perhaps, are already possessed of those qualities which real culture furnishes. "Real culture," says Mr. Copley, "is that which widens one's sympathies and thus is the cure for egotism or the inability to see oneself and one's work in proper relation to the universe." That is as good a definition as I have heard, and it is true to say that, in many respects, Taylor stood in need of no such cure. But, here and there in his life, one can see how this refinement of culture was lacking. He had great difficulty in formulating the philosophy of his achievements. None of his published works completely portray the essence of his philosophy. There was just lacking that breadth of perspective as a permanent attribute of the man. In flashes it came; within himself, inchoate and uncrystallized, it was there; but it was not a lasting light which he could turn on at will to reveal the inwardness of his life work. That others, who have taken upon themselves leading parts in the subsequent work of Scientific Management, have been university men, replete with the qualities which that training provides, is evidence that a movement so broad and so revolutionary has need of and can find niches for every type of mind.

To dwell upon the flaws in a mental armoury so commanding as that of Taylor is, however, to pick holes in the sky. I have left little enough space to consider what great thing it is that Taylor has contributed to the progress of the world, and to what particular end he himself considered his work had contributed.

Too little emphasis has, in general, been laid—an omission which this Life amply rectifies—upon the motive which caused Taylor to start upon and continued to inspire him in the work he achieved. Again and again, throughout his life, in terms which are absolutely unmistakable, Taylor testified to the one main purpose which dominated his work. In 1912, when referring to his first steps in developing his system, he said: "My whole object was to remove the cause of antagonism between the boss and the men who worked under him; to try to make both sides friends in the place of tactical enemies." The same thought is uppermost when, in 1914, in reply to certain criticisms, he wrote: "I cannot agree with you that there is a conflict in the interests of capital and labor. I firmly believe that their interests are strictly mutual, and that it is practicable to settle by careful scientific investigation the proper award that labor should receive for the work which it renders."

It is usual to speak of Scientific Management as a powerful lever in the elimination of waste, as the means best calculated to arrive at effective management, and as a sound set of principles to govern the development of an organization. But that was not the primary point of view which Taylor took, though the "engineer" within him could not but be gratified by such results. To Taylor, his system of management was primarily a means to eliminate the cause of friction between management and men. He held the old type of management responsible for the chaotic condition of industry in its "humanics." He drove to the heart of it, and determined not merely to effect a cure, but to remove the cause. We should regard Scientific Management, therefore, as preeminently a plan to solve the great social problem of industry, and secure an enduring industrial peace. It is for that reason, prime amongst others, that I regard the philosophy of Scientific Management (and, indeed, many of the mechanisms which Taylor introduced to put his philosophy into practice) as among the greatest of modern contributions to the progress of our social economy. It is not simply and solely a means to greater output and efficiency; still less is it a means to greater profits for the individual business. Primarily, its object is to remove the cause of strife and promote peace. Its field of service is not limited to this or that business; it is not even bounded by the confines of industry. Its service is to the world.

It is strange that, with this motive and object inspiring the work of its founder, Scientific Management should have been so strenuously attacked for its effect upon the worker. It has been accused of making men into machines, of creating narrow specialists in place of all-round operatives, of creating and furthering the monotony and consequent fatigue of the workers' life, of reducing the chances of a "square deal," of dispensing with the need for skilled workers, of overworking men and causing physical ills, of destroying initiative, inventiveness and ingenuity, of aiming to do away with unions, and of robbing the worker of his legitimate earnings By far the most formidable attacks upon Scientific Management have been from this angle. Yet Taylor himself said, "It appears to me that the effect of the system upon the workman is in the end the most important element in the whole problem," upon which Mr. Copley comments, "He regarded the reduction of labor costs as *very* important, and he regarded the increasing of wages as *very* important. But it was his deliberate opinion that the *most* important feature of any system must be its effect upon the workman's character." Of this fundamental purpose in Taylor's work his opponents, and perhaps some of his supporters and followers, have been neglectful. If for no other reason, the writing of this book would be well worth while, for its reminder to us that the main object of Scientific Management, in the conception of its greatest protagonist and exponent, was to better the human side, the "humanics" of industry.

There is, even amongst the most progressive employers, a tendency to think that the solution of the great human troubles of industry is not a matter for scientific research or for scientific administration. They fancy that it is a question of the heart rather than of the brain, thereby omitting to realize that the one is essential to the interpretation of the other. They often quite properly set up Employment or Personnel departments, but fail to realize that, though one may segregate in special units of the organization certain specific activities affecting the workers, one cannot by any means, divorce the broad problems of industrial relations from the day-to-day management. For management is essentially a daily relationship with the workers; these relations constitute the main problem of management. Any remedy must resolve itself into an improvement of the management. Any study of the causes of the problem must be a study of the methods of management. This is, indeed, fundamental to Taylor's philosophy. He would claim that the contribution of industry to social welfare is to be judged, not merely by the presence or absence of employment and welfare work, but by the extent to which *all* the work of management is motivated by and conduces to sound industrial relations. He would, I surmise, strongly deprecate the conception, which arises even in the best regulated industries, that managerial efficiency is something alien from the proper care of labor and from the study and practice of means to achieve a lasting settlement of industrial strife. On the contrary, he would claim that these things are possible only through scientific management, and that, in the individual factory, the burden of attaining these objects rests mainly on the shoulders of those who organize and manage the production and distribution of goods, and only in a certain specialized degree on those who specifically are charged with the care of the workers' welfare. The Labour problem, in fact, is not an isolated problem, to be dealt with by units not directly responsible for production and distribution, to be studied by organizations divorced from the daily planning and execution of work, but rather one aspect, and the main aspect, of the whole work of managing a business scientifically. The conception that responsibility for promoting sound industrial relations can be allocated to one specific unit, that such work calls for specialized capacities and is aimed at objects of only secondary importance to other units in the organization, is wholly opposed to Taylor principles. The object of Scientific Management and organization *is* the betterment of labor conditions and the promotion of peace; the whole organization is indeed a personnel department. The development of sound labor policy is, in fact, synonymous with sound organizing and management.

It is on this ground that Scientific Management, as a great movement, may rightly claim to be serving, not just this or that particular business, but the whole world of industry and the social and economic life of the community. It is not just a means to greater efficiency, in the sense of producing more goods, but a profound contribution to bettering the life of the community.

> I have been devoting my whole time (said Taylor) and almost every cent of money which I can spare from my income, to promoting the cause of Scientific Management; and my object in this work is primarily, I may say almost entirely, that of securing a larger measure of prosperity and happiness for the working people. I am, of course, and ought to be, interested in the material welfare of the companies who are using Scientific Management; but if the results of my work were merely to increase the dividends and prosperity of the manufacturing companies, I certainly should not devote my time to this object. Scientific Management is for me, then, primarily a means of bettering the condition of the working people.

Listen again to the significant words which Dean Sabine, of Harvard's Graduate School of Applied Science, addressed to Taylor:

> While listening to you and even more in thinking it over since I left you, I am persuaded that you are on the track of the only reasonable solution of a great sociologial problem. The systematization and standardization of work has a bearing far beyond the organization of a particular business or industry. I do not believe that you are a socialist any more than I am, but you are preparing data for the solution of a problem on which socialistic and cooperative movements have time after time been wrecked.

Far too little has been heard and far too little account taken of the possible contribution of management, scientifically conducted, to what one may call the sociological problem of industry. Some of the greatest minds have striven with the problem of Capital and Labor, as if these alone constituted the body of industry. Modern sociological and economic thought has yet to realize that Management is a third partner, whose position renders it an authoritative partner; that neither panaceas nor changes in heart, neither socialistic programmes nor experiments in cooperative working and governance will singly bring about a redirection of social progress, but rather the application to industry of the analytical and synthetical methods of science, by a body of management inspired by right-minded motives and viewing its work, in the day-to-day control of its shops and factories and warehouses, as highly constructive work in the building of a new order and the development of a new spirit in industry.

Consideration of Taylor's motive automatically tells us what was his conception of Scientific Management. To him, it was a philosophy, not a set of mechanisms or a hide-bound system. "The essence of modern scientific management," he said, "consists in the application of certain broad, general principles, and the particular way in which these principles are applied is a matter of entirely subordinate detail." And again, he said, "In its essence, Scientific Management involves a complete mental revolution"—on the part of the men and of the management. To this broad vision of Scientific Management he held throughout. In later years, when efficiency became a craze, and efficiency societies sprang up like mushrooms in a night, he maintained his same attitude—that Scientific Management was not essentially any of these things, but was "something that varied as it was adapted to particular cases, *but always involved a mental revolution of employer and employee toward their work and toward each other.*" To Taylor, Scientific Management was a journey to an ideal, a course which led to some ultimate condition. It was not a static system, but a dynamic philosophy. "Scientific Management," he said, "fundamentally consists of . . . . a certain philosophy which can be applied in many ways," and philosophy is purposeless without an ideal, and fruitless save as it serves to move life forward towards that ideal. One of our dangers is to regard Scientific Management as something we have "installed," when the essential consideration is whether our management and our men have achieved that mental revolution which makes any set of mechanisms living and permanent. In a phrase, this "complete mental revolution" consists of "recognizing as essential the substitution of exact scientific investigation and knowledge for the old individual judgment or opinion in all matters relating to the work done in the establishment." The Taylor ideal was a condition of industry where its daily tasks had been subjected to the reign of law, scientifically established, and equally binding on management and men. Towards this ideal his work was one long, consistent struggle. What was, indeed, the core of his work at Bethlehem? "Essentially, it was this: that the government of the Bethlehem Company cease to be capricious, arbitrary, despotic; that every man in the establishment, high and low, submit himself to law." "The gist of the matter is," wrote Taylor, "that Scientific Management demands that the acts of the men and movements of all these men and elements shall be regulated according to clearly defined scientific rules and formulae."

The most significant feature in Taylor's efforts to reach this ideal, however, is the fact that his main difficulty lay with the management rather than the men. Despite his early tussle with the men of Midvale, the main combats of his life were with those in the management. In some instances he encountered direct opposition; in others he had to face the perhaps even more difficult problem of the man who enthused over Scientific Management for others, but was himself not in need of its medicine. "It took over two years," said James M. Dodge, "for our organization to surrender fully, and so change our mental attitude that we became really receptive. I mean by this that I found no difficulty at all in having the heads of various departments agree that the introduction of the Taylor system would be most desirable, but in each case it was for everybody else in the establishment but entirely unnecessary for him." Taylor's own difficulties at Bethlehem and those of his associates in other plants afford ample evidence of the toilsome task it was to bring about in the various managements that "mental revolution" which he himself postulated as the essence of Scientific Management. Yet it was only to be expected, and remains still one of the major problems of his followers. For, upon management Taylor threw a greater burden; he made operative efficiency a problem which was up to the management. Moreover he demanded that management should subject itself to the reign of law which was the outcome of his scientific investigations, and further demanded that the petty despotisms of the old-time foremen and managers should be broken down, their work scientifically organized, and their positions rendered rather that of teachers than of driving masters. It was only human, perhaps, that these innovations should be opposed, and the "mental revolution" a very slow grinding of the wheels. Conservatism and inertia are the property of no class, and Taylor had too many sad experiences with managers to escape this fact. "It was his mature judgment," says Mr. Copley, "that the philosophy of 'initiative and incentive' was, in the main, the lazy manager's philosophy; the management could talk as it pleased about the workmen being supposed to be expert in their trade, but the real reason for putting the details up to the workmen was likely to be that the management was disinclined to assume the duties, burdens and responsibilities that naturally belonged to it."

Yet, it was true in Taylor's own work and is true today that efficiency must begin at the top. The workers cannot transfer their skill to a management which is not ready to receive and use it, nor can they single-handed standardize the conditions of their work. The development of efficiency is primarily a task of management, and efficiency is primarily a question of efficiency in those who direct and control the work of others. "Scientific labor can exist only as scientific management creates it. There is no labor that is scientific that is not the product of long arduous study with the methods of the laboratory," said Mr. Ernest H. Abbott in a singularly discerning statement. Management has yet to measure itself up to the standard which this ideal presents. It has yet to appreciate its responsibilities and the vast intricacy of its task. Whilst it continues to fall short, waste is the difference between what management is and what it should be. Of all documents perhaps the report of the Committee on Elimination of Waste in Industry is the strongest condemnation of the old-time management. It publicly places the main responsibility for waste on management. It is both a condemnation and a challenge. The philosophy of Taylor alone points the way to greater efficiency and it is upon management that the main responsibility must lie for bringing it about. General Crozier singled out as the feature which distinguished the scientific from other principles of management "the amount of administrative energy which is devoted to it," and by that energy alone is the herculean task of attaining the highest efficiency to be completed. Even amongst the managements which are definitely in sympathy with the underlying principles of Scientific Management, there is often a certain hesitation in putting any system based on those principles into operation, on the score of expense. Taylor himself, in fact, was often accused of "making the money fly." The tendency of most manufacturers, especially in times of depression, is to keep a very tight grip on the expenses ledger. Any system of scientific management, however, by throwing a greater burden on the management and by insisting that management shall work scientifically and not by arbitrary "rule-of-thumb" methods, necessarily involves, in most cases, an increase in the number of purely brain-workers over the number required under any non-scientific system. "The belief is almost universal among manufacturers," writes Taylor, in "Shop Management," "that for economy the number of brain workers, or non-producers, as they are called, should be as small as possible in proportion to the number of producers, i.e., those who actually work with their hands." And again, he wrote, "It has been my observation that there is no definite relation of any kind in the ratio of overhead expenses to direct expenses in the prosperity of a company . . . . I have found, however, that those companies which are managed in the very best way and which are earning the largest dividends in relation to their competitors, have the largest ratio of overhead expense in relation to direct expense . . . . As a general rule, I can say that the more men you can have working efficiently in the management, that is, on the management side, the greater will be your economy. No greater mistake can be made than to assume that economy is realized by cutting down the so-called overhead expense. Just the opposite is true in the very best managed companies." Mr. Copley's comment on this extract—that Taylor was a voice crying in ~~the~~ wilderness—is apt indeed, and is still largely true.

Management as a corporate body in industry has yet to see itself in its right perspective. It has yet to appreciate that business is progressing beyond the stage where it was a game of chance, a selfish, crazy tussle with capricious fortune, with alternating profits and losses, and is gathering speed towards an order of industry where the motive is that of social service and the methods are capable of scientific determination and regularized control. Progress towards this ideal is overwhelmingly dependent upon the energy, concentration and genius of management. Management will be called upon for a far higher standard of ability, a far higher concept of its duties and its relationships with the workers and the community, and a far higher development of its technique. It must bring more brainwork to bear on its task, more ethical considerations to fashion its motives and objectives. Perhaps the essence of what this deepening and widening of the sphere of management involves may be put in a phrase —that management is tending and must further tend to become a profession. The practise of a profession presupposes several things: firstly, a codified and proven body of knowledge, or, a science; secondly, a skill in the application of that knowledge, or, an art; thirdly, a progressive enlargement and intensification of the knowledge, or in fact the constant use of the scientific method; fourthly, a standard by which efficiency in the practice of the profession may be assessed; fifthly, a motive which places first the good of the community. If then, these be the conditions of a profession, management, as Taylor conceived it, and as the industrial world is now slowly coming to conceive it, is indeed a profession in embryo. It is the task of management—as skill comes to replace chance and luck, as more and more thought and research expands knowledge, as definite criteria of efficiency become possible for its various branches, and as the element of social service drives out the false domination of petty autocracy—to develop itself into a profession, with professional standards and ethics.

To this end all Taylor's phisosophy leads us; towards this ideal, the idealist in him constantly strove. "It is the promotion of harmony between employers and their workmen that is my chief interest," he said. And again; "All our inventions are meant to contribute to human happiness." Above all men, perhaps, Taylor exemplified the new management to which his vision and work gave birth—a management directed by a social motive, yet operating by severely practical and scientific means.

This book tells us of Taylor's own life and work, but in the few years since he died, the outcome of his work has been a universal stirring of management to an appreciation of its responsibilities. Consciously or unconsciously, this new movement has been inspired by his teaching and leadership. Scientific Management has come to be recognized as a philosophy which is applicable, not only to shop management, but also to every activity of a business, from accountancy to selling, and, further, to every corporate enterprise, whether it be a manufacturing concern, a professional society, or a municipal organization. His principles have spread, like a great flame over all the world. His published works have been translated into every language, from English to Chinese, from Russian to Spanish. Both the French and Soviet Russian governments have given his principles official recognition. From Vienna to Paris, Paris to London, and London to New York, the work he began is being carried on by his followers.

Bringing into the very shops of industry the quality of thought which is normally the attribute of the hermit of the laboratory and study; working in happy cooperation with other pioneers—his friends one and all, whose devotion to him was only equalled by his friendship and respect for them;—gilding his work with the rare gleams of far-looking visions, and buoying it ever on the tide of a high motive and objective; delving deep into the caverns of truth in the work-a-day things of life, and pressing fearlessly forward where the light of truth led him—Frederick Taylor set on its path a movement which, when the time comes to see it in its proper perspective, will have been found to have given a redirection to our social progress. At a time when industry was reaping the shrivelled harvest of low ideals and selfish, unlightened management he brought to it the fertile seed of high ideals and unselfish, enlightened management. "He injected the concept," in the words of Dr. Person, "that a business should exist for social service, that its purposes can be defined, its objectives planned and scheduled, detailed execution be so controlled as to contribute most economically to the final result, and that the final result can be a productivity of useful things so shared as to increase the comfort and promote the happiness of all concerned." Wherever Scientific Management is the philosophy governing the conduct of any enterprise, there will Frederick Taylor's spirit—and, as he would wish it, the spirit of his associates—be found still working. The day, indeed, cannot be far distant when Scientific Management will come to be recognized as a great social movement, not only by those in industry who are the immediate objects of its service, but by all that commonwealth which industry itself serves.

It was time that the life of Frederick Taylor should be written and published to the world, for, if he was a generation ahead of his time, that generation is now with us. He blazed the trail; we put foot upon a more royal highway. No more inspiriting message could come to us than this story—so faithfully told, so intimate yet so heroic and portentous—of the life of him who has been named, in a significantly mingled title,—a mingling of the man and the mission, the family and the world, the sowing and the fruit, the present and the henceforward, the mortal frame and the imperishable legacy, the body that fails and the thought that prevails—"The Father of Scientific Management."

BY THE elaboration of Standards, on the impersonal side of industry, through the analytical and synthetical methods of Science, and by the deductive determination of the principles and methods of management on the personal or human side, it is the aim of those practicing management to evolve, by a sharing of knowledge and experience, irrespective of trade and business divisions, a *Science of Industrial Management,* distinct alike from the sciences it employs and the technique of any particular industry, for the several purposes of forming a code to govern the general conduct of industry, of raising the general level and providing a standard measure of managerial efficiency, of formulating the basis for further development and improvement, and of instituting a standard as a necessary qualification for the practice of the profession. (Oliver Sheldon, *The Philosophy of Management,* pp. 290-291.)

A Critical Analysis of Scientific Management[1]

Its Accomplishments, Shortcomings, and Future Obligations

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IN PRESENTING this paper I find myself in the accustomed position of being "between the devil and the deep sea." I am peculiarly fortunate in that I am constantly being admonished as regards the Taylor philosophy of management by two groups—by one for being too "liberal," by the other for being too "orthodox"! I hope that the friendly protests I constantly receive from these groups have at least resulted in a balanced viewpoint. The following discussion is offered not primarily as a representative of any group, but as the personal observations of one who, in preparing this paper, desires to be neither modernist nor fundamentalist.

I. Some Prevalent Misunderstandings of Scientific Management

It is a little curious in view of the very considerable literature on the subject that the movement that we are discussing continues to be so persistently misunderstood. I believe we cannot do better than turn back occasionally to the fundamentals as expressed in the writings of Taylor in an effort to clear up not only what Scientific Management is *not,* but also to see what is the real essence of its philosophy. Mr. Taylor has constantly emphasized, for instance, that it is *not* any "system" or efficiency device or a new scheme of paying men, or time study, or functional foremanship;[2] that "the mechanism . . . must not be mistaken for the true essence or underlying philosophy" because "precisely the same mechanism will in one case produce disastrous results and in another the most beneficient;"[3] that "Scientific Management is *not* a theory" but that "it is the practical result of a long evolution."[4] He constantly combatted the serious and persistent misunderstanding that Scientific Management may be bought, or copied, and installed in a business in much the same fashion that a new process for making steel may be—a misunderstanding for which, as will be discussed later, I am afraid some of our own practices have been partially to blame. Mr. Taylor says: "The essence of Scientific Management consists in the application of certain broad, general principles, and the particular way in which these prin-

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[1] Paper presented at a meeting of the Taylor Society, New York, January 24, 1924.

[2] Hearings before Special Committee of the House of Representatives to Investigate the Taylor and Other Systems of Shop Management, H. R. 90, F. W. Taylor's Testimony, January and February, 1912, page 1387. "Scientific management is not any efficiency device . . . nor is it any bunch or group of efficiency devices. It is not a new system of figuring costs; it is not a new scheme of paying them; . . . it is not holding a stop watch on a man and writing things down about him; . . . it is not the printing and ruling and unloading of a ton or two of blanks on a set of men and saying, 'Here's your system, go to it.' It is not divided or functional foremanship; it is not any of the devices which the average man calls to mind when scientific management is spoken of . . . I am not sneering at cost-keeping systems, at time study, at functional foremanship, nor at any new and improved scheme of paying men, nor at any efficiency devices, if they are really devices that make for efficiency. I believe in them; but what I am emphasizing is that these devices in whole or in part are not scientific management; they are useful adjuncts to scientific management, so are they also useful adjuncts to other systems of management."

[3] "Principles of Scientific Management," page 128: "The mechanism of scientific management must not be mistaken for its essence or underlying philosophy. Precisely the same mechanism will in one case produce disastrous results and in another the most beneficient. The same mechanism which will produce the finest results when made to serve the underlying principles of scientific management will lead to failure and disaster if accompanied by the wrong spirit in those who are using it." Ibid, page 28: "Most of the readers of these (earlier papers) have mistaken the mechanism for the true essence. Scientific management fundamentally consists of certain broad general principles, a certain philosophy, which can be applied in many ways, and a description of what any one man or men may believe to be the best mechanism for applying these general principles would in no way be confused with the principles themselves."

[4] Taylor says, Cleveland Advertising Club, March, 1915 (Copley I, page 348): "Scientific Management at every step has been an evolution, not a theory. In all cases the practice has preceded the theory, not succeeded it . . . . Every new element has had to fight its way against the elements that preceded it, and prove itself better." And again, (Hearings, page 1415-16): "Far from being a theory . . . the theory of Scientific Management has only come to be a matter of interest and of investigation during the past few years, whereas this type of management itself has been in process of evolution during a period of about thirty years." . . . . it is the practical result of a long evolution."

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ciples are applied is a matter of entirely subordinate detail."[5]

Another fallacious idea for which no one in particular seems to be to blame (unless it be what Sheldon has called Scientific Management's "profligate pursuer, 'efficiency' ")[6] is that all one needs do to have Scientific Management is to introduce some sort of incentive payment scheme. Taylor's followers, largely without avail, have constantly reiterated his position on this point, as for instance, when he says: "Under Scientific Management the particular pay system adopted is of minor consequence, and in many of our establishments we have six different pay systems all going on at the same time . . . ."[7] He furthermore emphasized the "paramount importance" of standardization as a basis of incentive payment.[8]

So much very briefly for some of the things which Scientific Management is *not*. Although Mr. Taylor emphasized the fact that the theory and philosophy was given almost no attention until long after its development in numerous industries, it is rather significant that of all who have attempted to tell of what this movement really consists, we still turn back to Mr. Taylor for the most complete and convincing description of its theory and principles. It is important to note that his very first effort was to harmonize the interests of the workmen and the management; he gives this as the first object he had in mind when he was made foreman at Midvale.[9]

The importance in which he held the matter of mutuality of interest is made clear when he says: "Scientific Management has for its very foundation the firm conviction that the true interests of the two (employee and employer) are one and the same; that prosperity for the employee cannot exist through a long term of years unless it is accompanied by prosperity for the employer, and vice versa."[10]

As against these quotations from Mr. Taylor it is interesting to see what organized labor has to say in this connection: "It is not the mission of industrial groups to clash and struggle against each other . . . . Industry must organize for service . . . for justice to all who participate."[11]

In its essence, then, Taylor conceived the movement which he started to involve a "complete mental revolution on the part of the working man . . . and on the part of those on the management's side . . . both as to their duty to cooperate in producing the largest possible surplus and as to the necessity of substituting exact scientific knowledge for opinion . . ."[12]

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[5] "Shop Management," paragraph 290: "The principles and details which are admirable in one type of management have no place whatever in another."

In a letter to Holden A. Evans, Taylor wrote December 2, 1919 (Copley II, page 309): "The essence of modern scientific management consists in the application of certain broad general principles, and the particular way in which these principles are applied is a matter of entirely subordinate detail . . . . . As you know, I personally believe that certain methods of applying these general principles are better than others . . . . this, however, I look upon as entirely subordinate to the general principles and among those who have succeeded me in the business of introducing Scientific Management, there is not one who uses the same methods in any two successive establishments. The methods must in all cases be, to a considerable extent, modified to suit the special conditions and needs of each establishment."

Taylor at Cleveland Advertising Club, November 3, 1915 (Copley I, page 348): "All the men that I know of who are connected with Scientific Management are ready to abandon any schemes, any theory, in favor of anything else that can be found that is better. There is nothing in Scientific Management that is fixed."

[6] *Bulletin of the Taylor Society,* December 1923, Vol. 8, No. 6, p. 209.

[7] Taylor says (Harvard Business School Lecture): ". . . the average manager quite firmly believes that the whole art of managing men practically consists in the adoption of one or the other of these pay systems. Under Scientific Management, however, the particular pay system adopted is of minor consequence, and in many of our establishments we have six different pay systems all going on at the same time, each one having its especial advantages under certain conditions and at certain stages in the development . . . ."

Furthermore in the "Principles of Scientific Management," page 34, Taylor writes: "Under Scientific Management . . . . the particular pay system which is adopted is merely one of the subordinate elements."

And in "A Piece Rate System," paragraph 53, we find: "Whether cooperation, the differential plan, or some other form (of incentive payment) be chosen . . . . there are certain fundamental facts and principles which must be recognized and incorporated in any system of management, before true and lasting success can be attained, and most of these facts and principles will be found to be not far removed from what the strictest moralists would call justice."

[8] "Piece Rate System," paragraph 54: ". . . . not the least of the benefits of elementary rate-fixing are the indirect results."

And in paragraph 76: ". . . the rate-fixing department has shown the necessity of carefully systematizing all of the small details in the running of each shop . . . . These details which are usually regarded as of comparatively small importance, are of paramount importance in obtaining the maximum output, and . . . . require the most careful and systematic study and attention in order to insure uniformity and fair and equal chance for each workman."

[9] "Principles of Scientific Management," page 52-53: "Soon after being made foreman . . . he (F. W. Taylor) decided to make a determined effort to in some way change the system of management so that the interests of the workmen and the management should become the same, instead of antagonistic."

This attitude is further reflected in the opening sentence of the same book: "The principle object of management should be to secure the maximum prosperity for the employer, coupled with the maximum prosperity for each employee."

[10] "The Principles of Scientific Management," p. 10.

[11] Resolutions adopted at the October, 1923, meeting of the American Federation of Labor, held at Portland, Oregon.

He summarized the duties of the management in his four well-known "Principles": (1) the development of a science, (2) the scientific selection and development of the workmen, (3) the hearty cooperation with the men, and (4) the division of work and of responsibility between the management and the men.[13]

As a result of Mr. Taylor's vision expressed in these excerpts, and in the light of the best development of these principles in practice today, I believe that we can briefly summarize some of the significant viewpoints which distinguish this movement. I believe there is coming to be a better understanding that Scientific Management rests upon the viewpoints:

1. That business is organic, no part of which can function to best advantage until all parts function to good advantage;

2. That thorough standardization and scientific methods throughout the whole business are necessary for organic control, that management must be based so far as possible on facts, and that ignorance leads to more harm than does malice;

3. That the interests of the employer and employee are mutual; that, as Mr. Taylor says, the principal object of management should be to secure the maximum prosperity for employer and employee; that this viewpoint requires a change in mental attitude and a belief that employees cannot be tricked or driven into working efficiently, but that they must be carefully selected, trained in their jobs and fitted to the highest class of work of which they are capable, and that they be promoted on merit;

4. That the management must take the lead in bringing about proper conditions and mutual helpfulness;

5. That lasting development must come from within the organization; that Scientific Management cannot be "installed" from without; that outside assistance is often desirable, but that any outsider can do absolutely nothing unless the heart of the management is in the work, because the success rests absolutely on the management; that Scientific Management cannot remove the need of big men, but can make a little manager bigger and add permanence to the business.

6. That development must be democratic; that the road to opportunity must be kept open; that promotion must rest on proved ability backed by adequate records; and that sound methods will bring pressure to bear upon the management for the proper exercise of its functions;

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[12] "Hearings," pages 1387-89: "Now in its essence, Scientific Management involves a complete mental revolution on the part of the workingman engaged in any particular establishment or industry . . . a complete mental revolution on the part of these men as to their duties toward their work, toward their fellow men, and toward their employers. And it involves the equally complete mental revolution on the part of those on the management's side—the foreman, the superintendent, the owner of the business, the board of directors—a complete mental revolution on their part as to their duties toward their fellow workers in the management, toward their workmen and toward all of their daily problems. And without this complete mental revolution on both sides Scientific Management does not exist. That is the essence of Scientific Management, this great mental revolution."

Continuing, he says: "The great revolution that takes place in the mental attitude of the two parties under Scientific Management is that both sides take their eyes off of the division of the surplus as the all-important matter, and together turn their attention toward increasing the size of the surplus . . . They both realize that when they substitute friendly cooperation and mutual helpfulness for antagonism and strife they are together able to make this surplus so enormously greater than it was in the past that there is ample room for a large increase in wages for the workmen and an equally great increase in wages for the manufacturer. . . . . It is along this line . . . . . of the substitution of peace for war; the substitution of hearty brotherly cooperation for contention and strife; of both pulling hard in the same direction instead of pulling apart; of replacing suspicious watchfulness with mutual confidence; of becoming friends instead of enemies; it is along this line, I say, that Scientific Management must be developed.

"This change in the mental attitude of both sides toward the "surplus" is only a part of the great mental revolution which occurs under Scientific Management. I will later point out other elements of this mental revolution. There is, however, one more change in viewpoint which is absolutely essential to the existence of Scientific Management. Both sides must recognize as essential the substitution of exact investigation and knowledge for the old individual judgment or opinion . . . . .

"These are the two absolutely essential elements of Scientific Management."

[13] "Hearings," page 1393: "These new burdens and new duties assumed by those on the management's side are so unusual and so great that they are to the men used to managing under the old school almost inconceivable. These duties and burdens voluntarily assumed under Scientific Management by those on the management's side, have been divided and classified into four different groups and these four types of new duties assumed by the management have (rightly or wrongly) been called the 'Principles of Scientific Management.' "

These principles, or duties, he states ~~as~~ ("Principles of Scientific Management," page 35): "*First;* They develop a science for each element of a man's work, which replaces the old rule-of-thumb method. *Second;* They scientifically select and then train, teach, and develop the workman, whereas in the past he chose his own work and trained himself as best he could. *Third;* They heartily cooperate with the men so as to insure all of the work being done in accordance with the principles of the science which has been developed. *Fourth;* There is an almost equal division of the work and the responsibility between the management and the workmen. The management take over all work for which they are better fitted than the workmen, while in the past almost all of the work and the greater part of the responsibility were thrown upon the men."

7. That development must be based on principles, consciously, continuously and consistently enforced through *sound methods*.

Scientific Management is not "simply common sense"; neither is it simply the scientific method applied to the management of industry. Both of these definitions leave out of account the "mental revolution" and the mutuality of interest so constantly stressed by the founder of the movement. I believe "Scientific Management" at its best comes pretty close to being the golden rule made operative in industry through the scientific method.

II. Positive Contributions of Scientific Management

In setting down as impartially as I can what I believe to be the principal contributions of Scientific Management at the present time, it would, of course, be folly to claim any monopoly of effort along constructive lines for the movement as a whole or for any business operating under its principles. These cases are simply illustrations of what may be accomplished along so many lines, by a policy of conscious and continuous taking thought of the numerous economic and social factors which make for permanent success, and of coordinating these elements into a rounded, balanced management.

A. Original Contributions

The outstanding accomplishments of Mr. Taylor and his associates are well known and require only a reference. His revolutionary invention of high speed steel has had a profound effect on all metal-cutting establishments; as a result of long investigation we have the standard shapes of tools which are in everyday use in all well-run shops today, the marvelous slide rules devised by Mr. Barth, and the modern automatic tool grinder. As part of his early work also came the standardization of belting care and maintenance which constitutes best practice up to the present time. The present sharp line which well-run plants draw between planning and performance is a direct outgrowth of his later work. His instructional or functional form of organization, found in such wide use today, is a direct heritage from his early insistence on making the work of the management more effective. Over thirty years ago he devised a cost system which, with slight modifications, has not suffered in comparison with the best along this line that we have at the present.

Some of the significant contributions, as outlined in a paper by the present writer in 1919,[14] will be briefly summarized, but reference must be made to that paper for a more extended discussion of each of these contributions than is possible here.

1. The Mechanical or Impersonal Aspects

a. Increased Production

By far the most striking single fact as regards the results of Scientific Management is the very considerable increase in production it has effected with the same equipment and personnel. And this result has not been always secured, as might be assumed, from plants that were near the lower level of efficiency before the development took place.[15]

Of the various means by which Scientific Management increases production and decreases cost, some—such as the selection, fitting and training of the workers, the reducing of labor turnover, absences, lates, etc., the determining and securing of a proper day's work and the paying of a correspondingly increased wage—are distinct economic gains in themselves. These will be indicated under the human factors. Others, however, only indirectly related to questions of personnel relationship, merit mention here. Among the most important of these are:

(1). The *more effective utilization of equipment*, a use greatly stimulated by Mr Gantt's admirable idleness charts showing as accurately as may be the cost of each different kind of idleness;

(2) The *more effective use of labor* through scientific man and job analysis and the devising of better methods of work;

(3) The *strict regulation of materials* through simplification and standardization, and through methods of control of material activities;

(4) More accurate *routing*, including both the physical layout and the administrative control of work in process; and finally,

(5) The *regulation of industry*. Perhaps nowhere

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[14] *Quarterly Journal of Economics*, May, 1919, reprinted in *Bulletin of Taylor Society*, October, 1919, Vol. 4, No. 5.

[15] Besides the desire for increased production there has also been the determination to establish a more scientific and therefore more lasting basis for the management of industry, and to bring about better industrial relations. When speaking of increases in production, it must be remembered that a simple increase in production with accompanying decrease in a cost which was hitherto higher than it should reasonably have been, is not entirely satisfactory—it is only erasing the negative and getting back to par, as it were, but failing to add a plus. Where the increase in production and the decrease in already reasonable cost go hand in hand, however, as is characteristic of plants run under Taylor principles, the gain is direct and indisputable.

better than in the elimination of seasonal production and its attendant evils is the fact illustrated that what is of permanent benefit to the management also benefits the workmen, and vice versa. That seasonal variation in many cases is not an unpreventable waste has been amply proved by those industries which have attacked and eliminated the evil.

b. Improvement in or Maintenance of Quality

Scientific Management has pretty conclusively shown that as between speed and quality there is not only no intrinsic irreconcilability, but indeed that with intelligent handling an improvement in quality has usually accompanied increased speed. Just why this is so may be left largely to the psychologists—we are dealing simply with the abundantly proved fact.

c. Speedy Production and Accurate Delivery

The firm which can accurately predict and rigidly maintain delivery dates is not only in an enviable position from the buyer's standpoint, but may claim a distinct contribution to itself, to the buying public, and to the community at large. This control, characteristic of the properly managed plants, constitutes a decided antidote to the tendency for ever-increasing costs of living.

d. The Power and Stimulus of Knowledge

As a final consideration under the industrial or non-human aspects comes the confidence, the sense of security, the power and stimulus which spring from the knowledge that we have real control of our business through the ordered regulation of its activities according to adequate knowledge and best practice.

2. The Human Factor

Important though it be for the country at large that we have high production and low costs, that we establish a strong industrial basis, it is of greater importance that while we are making *things* we do not forget that our first and infinitely more important duty is the making of *men*—making good citizens.

a. Industrial Peace

The fact seems to be that in scientifically managed plants there has been remarkable freedom from the turbulent and distressing manifestations of industrial maladjustments characteristic of the last few years. This absence of labor trouble is due undoubtedly to a combination of causes; to a spirit of cooperation—the "mental revolution" which is such a vital part of Scientific Management; to fair dealing; to a proper work environment; to a spirit of democracy; to increased individual production; to high wages unaccompanied by over-exertion; and to a feeling on the part of the employee that his best interest is being and will be looked after. It is due indeed to all these factors; it is inclusive of them all.

This fact is of pre-eminent importance at the present time. The bringing about of industrial peace in its establishments is unquestionably *the greatest* contribution of Scientific Management.

b. High Wages

Increases in the earnings of operatives working under Scientific Management are too common and well known to need repetition.

c. Proper Working Hours

Mr. Taylor was one of the first to recognize and to prove the fact that overlong working hours are not conducive to high output, and that in very many cases hours of work may be sharply decreased up to a certain point and output increased simultaneously.

d. Conditions of Work as Related to the Health and Well-Being of the Worker

Looked at from the entirely personal, selfish, financial aspect, there can be no question that the very best condition of the employee is the very best condition for the owner of the business. That the owners and managers of plants under Scientific Management primarily and continuously have the best interests of their people at heart—not from any ulterior motives, however, but because they are "that sort of person"—I believe can be doubted by no one who will take the trouble to visit them and their employees.

There is another phase of this question, however, which is of much greater importance in that it affects the workman during his entire life as a productive member of society. This is the determination, through time study and allowances for rest and necessary delays, of "the best day's work that a man could do, year in and year out and still thrive under." It is significant that the first "fatigue study" ever conducted in a really scientific manner, so far as the writer's records show, was performed over thirty years ago by Mr. Taylor as a part of his determination of a proper day's work.

In closing the discussion of this particular topic, it may be stated that, in spite of the oft-expressed fears that the so-called "speeding-up" would result to the immediate or ultimate detriment of the worker, no authentic case of anything but beneficial results of high individual production has been brought to light.

e. Selection, Fitting and Training

It would be difficult to overestimate the advantage both to the individual and to the nation of a condition where each person could be engaged, under conditions satisfactory to him, upon work for which he is naturally best fitted.

In plants run under Scientific Management, committed as they are from early days to a policy of "scientifically selecting, training, teaching and developing the workman," it is the customary thing to find operatives who are now doing excellent work on their third, fourth, or even fifth trial after having previously been unsuccessful at work for which even they originally thought they were best fitted. We naturally expect to find, and do actually find, numerous cases of promotion from the ranks.[16]

f. Free Scope for Individual Initiative and Opportunity for Advancement.

The criticism has been made that in working under the highly standardized conditions and detailed instructions that Scientific Management insists upon, there can be little chance for the exercise of one's individuality. This accusation is true in that we do not let a novice tamper with a new and delicately built mechanism until he proves that he has mastered it.[17]

It is not individuality and initiative run wild which is really constructive; it is intelligently applied individuality, and prerequisite to this is an understanding of things as they are and how they have come to be what they are.

So far from killing the right kind of initiative, Scientific Management plants are promoting individual initiative in the truest and highest sense—the intiative of the enlightened type of workman. The oft-quoted criticism that under Scientific Management the worker's job is monotonous, overlooks the fact that monotony is due not so much to the unvarying repetition of recurrent operations, as to the accompanying feeling that the work holds no future possibilities. The consistent policy of promotion from the ranks has done much to make every workman feel that he has a marshal's baton in his knapsack. Instructional (or functional) foremanship opens up avenues for advancement to others than the exceptionally gifted workman.

g. Reduction of Labor Turnover

Much of the restlessness in industry is curable. It is caused by the existence of unsatisfactory conditions in just those features of management discussed in the preceding topics—too low wages, long hours, poor working conditions, lack of proper selection, fitting and training, and to a conviction on the part of the employee that for him his present job in his present place offers no future. Naturally, therefore, with the removal of the causes in any particular place the evil itself largely disappears. This has been the experience in numberless plants which have adopted advanced measures more or less completely.

h. Spirit of Cooperation and Confidence and Feeling of Security

As a result of all of the positive products of advanced management enumerated above come the last and most important of them all. Indeed, so important are the spirit of cooperation and confidence and the feeling of security on the part of the whole personnel that nothing should be allowed to undermine them; for without them, although a certain *efficiency* may be obtained, *true Scientific Management* is impossible.

Cooperation may be obtained only by securing the *confidence* of those with whom we deal, and this confidence in turn results only when each man feels *secure* in the belief that he is in the best possible place for him and that he need have no fear for the future so long as he fully plays his own part. Only when the management really assumes its full share of the work and the responsibility may his confidence be secured. And only through making this security and this confidence an actual fact has Scientific Management been able to produce what it so highly prized and what it has so remarkably obtained—true cooperation.

B. Refinements in Technique

There are some significant advances which have been made during the last few years which can be referred to only briefly. Since progress has been rapid and widespread, the following list of accomplishments must necessarily be incomplete.

1. Cost Methods

Mr. Taylor's early work set up admirable means for the collection of costs and the distribution of overhead expenses.[18] Mr. Gantt emphasized strongly the desirability of ascertaining that part of expense of operation which was due to idleness of various causes. The result has been that in the last few years much attention has been given to the establishment of "standard costs" or standard rates for overhead distribution. In fact, I question whether the pendulum has not swung too far in this direction in that the actual cost is too often disregarded by simply taking the difference between actual and standard directly to Profit and Loss. I feel that Mr. Taylor himself would have heartily approved of setting up a normal or standard overhead rate, but that he would have most emphatically condemned our using the resulting theoretical cost figures alone without being able to compare them with the facts—the actual cost of the product, including all expense of turning that product out.

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[16] Starting with the original instructional foreman inappropriately called the "Disciplinarian," now developed into the modern functionalized Employee's Department (known variously also as the Personnel Department, the Labor Department, the Employment Department, etc.), there is set up not only a means for bringing to pass such conditions as those described above, but also the means to establish and maintain a more intimate personal touch between management and men, and to sit in judgment over the employee on the one hand and the management on the other—acting as buffer, as it were, between the two. The very recent widespread adoption of this safety valve is a decided step in the right direction.

[17] As Alexander Meiklejohn says ("College and the Common Life," *Harper's*, November, 1923): "Let it be understood among us that no man has a right to any opinion on any subject unless it rests upon the best thinking which we have upon that subject."

2. Organization

What seems to me to be one of the really significant developments is that made by the Joseph & Feiss Company in functional organization. Among other valuable features, this organization is tied absolutely to the cost classification so that the expense of performing each function is definitely tied to the man responsible for that function. It is hoped that this matter will be the subject of a future paper before the Society.

3. Fatigue

The publication in 1917 of Merrick's articles on "Time Study for Rate Setting" (followed later in book form), with the fatigue allowances presented, can by no means be overlooked as a distinct addition and extension of Mr. Taylor's pioneer work in the study of rest and delay allowances.

4. Executive Reports

Much remains to be done in the field of executive reports, both as to subject matter, form, and period of time covered. There are two noteworthy developments which must be mentioned here: one, the admirable administrative guide called the "Progress Chart," devised by Mr. Gantt; the other, the advanced thinking presented in a paper entitled "A Technique for the Chief Executive" presented to the Society in 1921 by John Williams.[19]

5. Control

We are familiar, of course, with the refinements of control worked out by Mr. Barth and Mr. Babcock at the H. H. Franklin Manufacturing Company. I am not sure that the latter gentleman has not at the Holt Manufacturing Company out-Babcocked himself in securing a degree of control that seems to come pretty close to the ultimate goal. With Mr. Babcock's permission I quote from a statement on this subject which he gave me under date of December 29, 1923:

> A significant fact which should be noted in connection with the results of scientific management at this plant is the absolute control and regularity with which our product is produced. For a period of 496 working days, starting with March 13, 1922, up to the present time, our shops have not failed in one instance to bring through exactly the number of units of product which were scheduled to be finished on each of the 496 working days.

6. Adaptation of Methods

As is pointed out later, one of the most serious shortcomings of which we as a group are guilty is an over-readiness to accept as suitable, under a wide diversity of conditions, methods which have proved satisfactory in one or more instances. I am glad, however, to record the fact that a distinct advance has been made in the last two or three years; first, in analyzing the particular situation in hand, and second, in devising methods to meet that situation.

C. Application to Broader Fields

This record would be incomplete without referring even very briefly to the significant extension of Taylor principles to fields outside of production proper. Probably as fine an example of Scientific Management as we have today is to be found in the non-selling departments of the Jordan Marsh Company of Boston, Mass. Should the members of this Society have an opportunity to investigate that development I am sure that they would be struck with the extent to which the principles, and even the detailed methods, with which they are familiar in a factory, have been applied to a department store. The work which has reached such a high plane in this firm is being extended in several other similar establishments. Similarly, the managements of general offices in manufacturing plants, and banks, etc., particularly as regards layout and office procedure, are being reorganized in several instances in accordance with the principles found so effective in the factory.

It would be impossible in the space available to give due praise to the splendid development of the principles and methods which such firms as the Dennison Manufacturing Company, and the Joseph & Feiss Company have made in the selling ends of the business. I believe the leadership which a few of these firms is showing in the field of distribution is destined to have a profound affect on American industry.

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[18] This distribution was such as to load all expenses of running the business during a given period on all products made during that period, the variations from period to period being ascertained and watched by means of shop and general expense rates worked out currently.

[19] Printed in *Bulletin of Taylor Society*, April, 1922, Vol. 7, No. 2.

A significant line of development also is experienced in the maintenance department of a large eastern mill. Gratifying savings in cost of actual repairs as well as freedom from breakdowns have been made through careful inspection, through standardization and advanced planning of all maintenance work so far as it can be foreseen, through elementary time study, and through the payment of bonus.

Reference should here be made to the widespread adoption of budgets and quotas as simply an extension of the general principle laid down in "Shop Management" of setting up standards and of measuring actual performance (whatever form it may take) against such standards.

Reference has been made to the early efforts of Scientific Management plants to regularize production. It is gratifying to note that these attempts have been followed up and extended to cover the span of the business cycle.

Following the extension of the principles of Scientific Management to the selling end of several businesses, has come the effort, as yet scarcely under way but destined to receive increasing attention, to raise the level one stage higher by extending the same principles to the control of the total activities of the business. This attempt to coordinate sales, production and finance, coming to be known as "master planning for balanced management," is occupying much attention today in progressive firms.

D. General Influence on Industry

Mr. Taylor as early as 1895 said:

> This system of management will be adopted by but few establishments, in the near future at least, since its really successful application . . . . involves such thorough organization that . . . . but few manufacturers will care to go to this trouble until they are forced to . . . .[20]

Although this prophesy regarding the number of establishments has been borne out, nevertheless the influence of Taylor philosophy on industry has been tremendous. Many organizations which would be very loath to admit it, show unmistakably the influence of this movement. The growth in numbers of really scientifically managed plants has been slow, but what is of much more importance, there has been a growth, and this growth has been entirely healthy and permanent.

1. Although some other "philosophies" of management can claim many more original converts, nevertheless the plants which have really achieved true Scientific Management almost without exception are running along as merrily today as they were five, ten, or twenty years ago, while the examples of these other systems existing today are exceedingly rare. The object lesson of this permanence resting upon thorough conversion has not been without its effect on industry generally.

2. This permanence is particularly striking in view of the readjustment period since the war. The present writer raised the question just prior to the depression as to whether the methods or even the principles of Scientific Management would not have to be very closely scrutinized and possibly materially modified during the coming years of a declining market. Rather extensive investigation, both personally and through correspondence, has revealed the gratifying fact that these principles have in no way been found wanting, and that in most cases not only the principles but the methods used have stood up together with altogether healthy refinements and modifications made to adapt them to changed business conditions.

3. Scientific Management has affected industry generally by pointing out the only known method of attempting even a partially satisfactory solution of wage problems, that is, by making a sharp distinction between the *amount of work* and the *amount of pay* for that work. Only through a determination of a standard output may industry be assured against a disproportionate increase in the cost of living due to possible decreased production with increased wages.

4. Another significant influence has been the lesson pointed out so forcibly that it is the little things which produce profits. Seldom can dividends be paid out of revolutionary inventions — they must ordinarily come through constant attention to what someone has called the "tremendous trifles."

5. Possibly the greatest effect, although as yet not very widespread, is the emphasis which Scientific Management has placed on the responsibilities of the management as against those of the workman. It has been shown conclusively, I believe, that it is the *management's duty* to bring about thorough standardization and accurate planning and control before asking the

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[20] "A Piece Rate System," paragraph 89.

workman through an incentive method of payment to exert himself toward increased production.

6. Finally, the general acceptance on the part of the average manager of the desirability and place of the scientific method in the management of business has been particularly noticeable during the last few years. It is true that many managers still shy at the word "science," and it is true that we have as yet barely scratched the surface in the application of the scientific method to industry, particularly as regards departments other than the shop; but the entering wedge has been driven, and as Professor Sederholm of Finland has said:[21]

> . . . . Industry . . . . has not yet advanced beyond the Mesozoic stage, but the time will soon come when people will regard shops without a planning department of sufficient size, shops where hundreds of laborers are managed by half a dozen of engineers and foremen, with the same wonder as is felt by us when we look at the skeleton of a *Diplodocus Carnegie* with its gigantic body and almost microscopical brain.

III. Neglected Opportunities

It has previously been stated that it would be improper to claim for the Scientific Management movement any monopoly of effort and accomplishment along many of the various lines indicated previously, although this movement has always been at the front of new developments. In considering what seem to me to be some of our neglected opportunities, I wish also to state that Scientific Management as such must not be blamed because it has not completely solved partially unsolvable problems. It must be remembered that many of the unsatisfactory conditions under which we work today are heritages of an age long past. The problems and ills of the individual due to the massing of workers, the economic dependence of the employee on the employer, the specialization of process and the minute subdivision of labor have not, as is sometimes intimated, been brought on *by* Scientific Management. They are inherited problems and abuses with which, in common with other agencies, Scientific Management must deal. The following queries are therefore raised, as to whether Scientific Management has made as aggressive an attack on these bigger problems as it might have. The attempt will be made to deal only with those features which we can remedy or at least strongly ameliorate, and which, therefore, will be of concern to any group interested in the future of the movement.

A. The Art as Distinct from the Science of Management

Oliver Sheldon has forcibly brought out[22] the distinction between "operative sciences," which embody standards of procedure with respect to different kinds of processing, the "managerial sciences" or the sciences of putting these standards into operation, and the general administration of an enterprise. He further brings out very clearly the fact that while there may be a considerable managerial science, there is without question much in management that must remain an *art*. There must still be required the skilful exercise of human faculty, since there can be no science, for instance, of cooperation—cooperation rests not on scientific but on ethical principles. I believe Sheldon has done a real service in putting this viewpoint before the Society and that because we have not sufficiently recognized these distinctions in practice, we have fallen into a number of serious errors.

I wonder whether we have given sufficient weight to the question of personality in management; I wonder whether we have not tended a little too strongly to establish scientific methods, to tie these together into a logical "system," and to rely on this oftentimes beautifully designed machine to accomplish our objects, forgetting that such a system, just as is the case with any other system or mechanism, requires human direction and control?

I wonder if we have sufficiently realized that, in order to live up to Mr. Taylor's ideals, the need of real leadership is even more necessary than under the older types of management; I wonder whether on the contrary there has not been a tendency to employ too cheap clerks at certain strategic positions in the organization, trusting that the carefully outlined procedure would make up for their lack of leadership and personality?

I wonder whether, with our admirably proper insistence on considering each individual as an individual, we have not obscured the possibility of making that individual and his fellows more productive and more contented through recognizing the psychological benefits to be gained through group dealings?

I wonder whether we have considered the question of fatigue from a too coolly scientific viewpoint?

B. Labor

Many of us feel that it is unfortunate that Mr. Taylor expressed himself so frequently and so forcibly on the question of soldiering, and that he emphasized the profit motive on the part of the workman almost to the exclusion of other instincts and motives in life in which at heart he knew every workman is interested. This attitude on the part of the leader I fear has been too largely inherited by his followers. I believe it is true that the average American workman is not inherently lazy, but on the contrary is delighted to put forth his best efforts in production and in cooperation where he can be even reasonably assured that the management is doing its own part and that it really has his best interests at heart. Have we had the dollar so firmly fixed before our own eyes that we have assumed that the workman is similarly constituted, overlooking the workman's pride in workmanship, his logical desire to retain what he considers to be his own tools of livelihood . . . his trade secrets . . . and his desire to be a regular fellow in his own group? I wonder if we have sufficiently remembered Mr. Taylor's admonition:

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[21] Copley, II, page 126.

[22] *Bulletin of Taylor Society*, December, 1923, page 210.

> The principles of Scientific Management must rest upon justice to both sides, and it is not Scientific Management until both sides are satisfied and happy.
>
> Now if the mechanism . . . of Scientific Management . . . is used by unscrupulous people, it is not then used under Scientific Management; it may do a durned lot of harm.[23]

Can we honestly say with Mr. Taylor:

> . . . if the results of my work were merely to increase the dividends of the manufacturing companies, I certainly should not devote my time to this object. Scientific Management is for me, then, primarily a means of bettering the condition of the working people.[24]

I wonder whether we have sufficiently realized that to get real cooperation on the part of all of our people it is desirable to give them the psychological appeal of at least some stock ownership in the enterprise? Experience has proved that stock ownership by the employee has a tremendously beneficial effect upon the management. Incidentally, I wonder whether we have considered also our obligation to the public at large, whether Mr. Taylor's comment given below does not apply with considerable force even today:

> Most of us see only two parties to the transaction, the workmen and their employers. We overlook the third great party, the whole people, the consumers, who buy the product of the first two and who ultimately pay both the wages of the workmen and the profits of the employers.[25]
>
> The rights of the people are . . . greater than those of either employer or employee.[26]

C. Organized Labor

Scientific Management has to date neglected its opportunities and obligations to organized labor. There are many indications that organized labor's attitude and cooperation with managers in the application of the principles of Scientific Management have changed for the better. We should, however, show more readiness to meet organized labor half-way in a constructive program, and also aid by combating in a helpful non-antagonistic spirit the uneconomic practices on the part of some labor leaders. I believe there are great possibilities for cooperation, but they imply a prime obligation on our part of absolute straightforwardness and friendly instruction in the high principles for which we stand. It also places upon organized labor a prime obligation of recognizing that all men are not created mentally, mechanically or productively equal, and of allowing individual liberty to produce up to individual ability.

Mr. Taylor's attitude towards organized labor has been misunderstood by most people. For his views we can turn to his own writings:

> . . . in many establishments under the ordinary system, collective bargaining has become and is in my judgment an absolute necessity.[27]
>
> . . . there is no reason on earth why there should not be collective bargaining, under Scientific Management just as under the older type, if the men want it.[27]
>
> . . . I have not the slightest objection, and never had had, to collective bargaining, but I merely say that under the principles of Scientific Management that necessity has never come before me.[28]

D. Lack of Adequate Analysis

What I shall have to say under this topic will be largely destructive criticism. It is offered merely as having possible value for future analysis.

It seems rather an anomaly to charge against engineers and scientific managers, above all things a lack of analysis, yet I feel that this is one of the most serious criticisms to be leveled against most of us who attempt to follow the technique of Mr. Taylor. I believe it is partially due to the fact that we are so intent upon following him that we do not always stop to realize that he himself would undoubtedly have disapproved under present conditions numerous things which we have done and have left undone in his name.

Our most serious failure is neglecting sufficiently to analyze the particular sales, production and financial problems of the particular business before attempting to apply methods for more effective management. The fact that practically all groups particularly interested in industrial management have done likewise does not by any means excuse us who have the reputation for possessing a scientific, analytical method of attack. I refer specifically to an analysis of the general type of industry (assembly or continuous); to the present size of the business; to the competitive state of the business; to the character of the personnel as regards the skill required on the part of the management and the workmen, and the general "intelligence level" of this personnel; to the traditions and type of management, i. e. whether autocratic or democratic, its policy as regards promotion from the ranks, and the mental and spiritual development and coordination of personnel; to the degree of quality required in the various operations and in the finished product; to the existing degree of departmentalization, and the possibility of modifying present arrangements in this respect.

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[23] "Hearings," pp. 1459, 1462.

[24] Copley, II, page 236.

[25] In a letter written in 1911, Copley I, page 13.

[26] "Principles of Scientific Management," page 136.

[27] "Hearings," page 1444.

[28] "Hearings," page 1458.

All of these factors and many more, I submit, must be carefully analyzed before even the general type, much less the details of production control most suitable to the particular circumstances, can be determined. I believe we should not have quite so much argument as to whether centralized or decentralized management is better if we confined our arguments to a particular plant of a particular size, because the question of the proper degree of centralized as against decentralized control is very considerably one of size and departmental arrangement. Similarly, the types of organization, the questions of degree of functionalization, are scarcely things to be scrapped over in general but only as regards a particular situation. We have had too much of a tendency to impose our pet mechanisms promiscuously on plants of widely different character, just as was so long ago the custom with certain persons to sell family medicines good for all diseases. As a result, individual businesses have had to cast off these unsuitable mechanisms (mechanisms perfectly good in themselves when used under the right conditions) with the result that in more than one case I have in mind not only the mechanisms but even the principles for which we stand have become discredited.

Is it not still true that as Robert G. Valentine said[29] in 1915:

> A great deal of the Scientific Management in use at the present day, whether in sales, finance, production or personnel, is similar to the situation in which a great deal of money might be spent in curing of flat foot a person who had some disease of the bone which might lead to amputation. This lack of coordination is an excellent illustration of one of the basic inefficiencies which permeates the world today.

It becomes so easy to let good enough alone, to use outworn mechanisms and to hold to outgrown notions. As Alexander Meiklejohn says:[30]

> . . . The bane of a democracy is the man of easy solutions . . . such a man is a pest when there is thinking to be done. He does not need to think; he knows. He does not need to experiment; he has already found out. His father has told him, or his party, or his common sense, or his church.

It is a pleasure to quote Carl G. Barth:[31]

> . . . the fact so often laid stress upon by Mr. Taylor himself . . . that while the principles of his system of management were essential, yes even perhaps as immutable as the laws of nature, the detail mechanisms he had to date developed for the attainment of the results aimed at, were necessarily subject to continual, if not continuous, growth and change. He laid such stress on this as to express the opinion that not a single one of his details, either paper forms or mechanical contrivances, would be in use ten years after he handed them over to myself and my co-workers.
>
> Because Mr. Taylor invariably insisted upon the use of such forms and contrivances as had been developed . . . up to a certain time, until the members of a new organization should have become thoroughly familiar with these, his "system" undeservedly got the reputation of being an uncompromising and rigid code . . . .
>
> . . . Whenever a workman had learned to obtain results known to be possible by an implicit following of . . . instructions, Mr. Taylor even insisted on a special reward being given him for any suggestion that would lead to improved instructions and better results.
>
> Mr. Taylor's whole spirit was that of continued progress, *but by evolution only and not by revolution* . . . . .

It is in this spirit that progress must be made.

E. Our Failure to Get Our Message Accepted

It is folly to delude ourselves into believing that the message which we have been preaching for thirty years has reached the average or even the high-grade manager. The apparent salability of various "efficiency systems" and incentive payment plans, dressed up in new and attractive clothes but as a matter of fact violating the very basic principles of sound management which we have been proclaiming, would seem to testify to our failure to impress the average manager of industry.

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[29] *Bulletin of Taylor Society,* Vol. 8, No. 6, Dec., 1923.

[30] "College and the Common Life," *Harper's,* November, 1923.

[31] *Bulletin of Taylor Society,* December, 1921.

Believing as firmly as we do in the fundamentals of the industrial philosophy initiated by Mr. Taylor, why have our mechanisms and methods received so much attention at the expense of the basic principles? Why have we failed to make management and men realize the mutuality of interest existing between employer and employee; to bring the management to a realization of its own responsibility as against that of the workman;[32] to make the manager know that before he is justified in an appeal to the workman through incentive payment or any other measures to give forth the best he has, he, the manager, must first do his full share in standardization, planning and the providing of proper working conditions?[33] Is this condition due partly to complacency, or to a lack of aggressiveness or persuasive powers on our part?

To be sure, it is sometimes difficult to get some managements to assume their just share of the work and the responsibility, and Taylor himself had his share of this difficulty.[34] That the development of his principles of management would necessarily be slow, was foreseen by Mr. Taylor as early as 1895, and he emphasized the very necessity of slow development.[35] Yet I find most managers are willing to do their share when it is made clear to them of what their share really consists. I wonder how much of our failure to impress the manager and to secure the progress we desire is because we have given more thought to training the workman than we have to training the management?[36]

Much of the disregard of what I believe to be fundamentally sound principles of industrial relationship as laid down by Mr. Taylor has been due to a lingering prejudice against the name "Taylor" and to a reaction of scepticism connected in the linking of the terms "scientific" and "management."

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[32] "Hearings," page 1393: "By far the greater gain under Scientific Management comes from the new, the very great, and the extraordinary burdens and duties which are voluntarily assumed by those on the management's side."

[33] Taylor certainly emphasized as hard as he could the part that standardization must play in good management. For instance, ("Shop Management," paragraph 284): "It would seem almost unnecessary to dwell upon the desirability of standardizing, not only all of the tools, appliances and implements throughout the works and office, but also the methods to be used in the multitude of small operations which are repeated day after day . . . . . In the type of management advocated by the writer, this complete standardization of all details and methods is not only desirable but absolutely indispensable as a preliminary to specifying the time in which each operation shall be done and then insisting that it shall be done within the time allowed."

Again (in paragraph 285) he says: "Neglecting to take the time and trouble to thoroughly standardize all of such methods and details is one of the chief causes for setbacks and failure in introducing this system . . . . It is uniformity that is required. Better have them uniformly second class than mainly first with some second and some third class thrown in at random . . . . In fact, however, it is not a matter involving any great expense or time to select in each case standard implements which shall be nearly the best or the best of their kinds. The writer never has failed to make enormous gains in the economy of running by the adoption of standards."

Again ("Shop Management," paragraphs 297-8) in listing steps in developing Scientific Management he puts at the very top of the list: (1) The introduction of standards throughout the works and office.

The necessity of standardization as a fundamental prerequisite was again emphasized in paragraph 269.

[34] "Hearings," page 1445: ". . . I wish to repeat and emphasize, that nine-tenths of the trouble comes from those on the management side in taking up and operating a new device, and only one-tenth on the workman's side. Any difficulties are almost entirely with the management." This is constantly emphasized (see pages 1401, 1465).

An inkling of what some of these duties of the management are is given when he says (Hearings, page 397): ". . . . I can say, without the slightest hesitation, that the science of handling pig iron is so great that the man who is to handle pig iron as his daily work cannot possibly understand that science . . . . . the man who is fit to work at any particular trade is unable to understand the science of that trade without the kindly help and cooperation of men of a totally different type of education . . . . . ."

[35] "Hearings," page 1437: ". . . even in the most elementary work, to make this great change (to Scientific Management) is a question, not of a month, not of a year, but two or three years, even in the most elementary work, and that in an intricate establishment it is a matter of not less than five years before a great increase in the output per man can be made."

"A Piece Rate System," paragraph 89: "From what the writer has said he is afraid that many readers may gain the impression that he regards elementary rate-fixing and the differential rate as a sort of panacea for all human ills. This is, however, far from the case. While he regards the possibilities of these methods as great, he is of the opinion on the contrary, that this system of management will be adopted by but few establishments, in the near future at least, since its really successful application not only involves thorough organization, but requires the machinery and tools through the place to be kept in such good repair that it will be possible for the workmen each day to produce their maximum output. But few manufacturers will care to go to this trouble until they are forced to."

"A Piece Rate System," paragraph 90: "It is his opinion that the most successful manufacturers, those who are always ready to adopt the best machinery and methods when they see them, will gradually avail themselves of the benefits of scientific rate-fixing; and that competition will compel the others to follow slowly in the same direction."

[36] In this connection a word of emphasis is justified on the value of the task idea, particularly when preceded by rigid standardization and coupled with incentive payment as in Mr. Gantt's task and bonus method of payment. The task when thoroughly operative furnishes a tremendously democratic pressure from below in forcing the management to continuously hold up its end of the bargain. Taylor says ("Principles of Scientific Management," page 39): "Perhaps the most prominent single element in modern Scientific Management is the task idea . . . . The task is always so regulated that the man who is well suited to his job will thrive while working at this rate during a long term of years and grow happy and more prosperous, instead of being overworked."

Again, on page 122: "The task and bonus are especially important from the fact that they are, as it were, a climax, demanding before they can be used almost all of the other elements of the mechanism, such as a planning department, accurate time study, standardization of methods and implements, a routing system, the training of functional foremen or teachers . . . etc."

Undoubtedly also our message has not been more fully absorbed because, as Taylor himself has pointed out, the easy way is usually more attractive to the average manager. Short-cuts are particularly tempting. It is due also to the fact that we have been talking calculus much of the time when the manager is still struggling with elementary algebra.

Primarily, however, I believe it is a case of psychology. Mr. Taylor himself was not noted for his tact and appreciation of the psychological elements in human affairs, and I am afraid that we have tended to forget certain principles of mass as well as of individual psychology. I am afraid that we have too often given the impression to the manager that nothing which he has or does is worth much, that we have asked him as well as his workmen to "lose face" by expecting that he "back up" on matters which he cannot do without losing status, as well as by failing to give credit for good work and good suggestions where credit is due.

We must admit that some who are least sound in their principles and least scientific in their work have been better missionaries than we have. Impossible programs are proposed in the name of Scientific Management, and when these superficial substitutes are sold it adds to the doubt and distrust of intelligent management as regards the whole movement.

On the whole, however, as has been intimated before, I have found recently a very deep interest in really scientific methods of management and a much more open-minded and receptive attitude generally in any effort to really take advantage of what Mr. Taylor has given the world. For this we very largely have to thank the splendid constructive work of this Society under exceptionally able leadership. I am not preaching pessimism and discouragement therefore, but exactly the reverse, for I believe we are on the threshold of a development along lines which we believe will far surpass anything in the past. But the extent to which we can take pride in this growth and its permanency, and the extent to which we will be relieved of the present necessity of denying responsibility for attempted short-cuts, which have no part in our philosophy but which nevertheless reflect back upon us, will depend upon the extent to which we first formulate and then secure the acceptance of the fundamental and underlying principles of this whole movement—the mutuality of interest of all parties, standardization as a basis of good management, the primary duty of the management to assume its full share of the work and responsibility; realizing that unless we ourselves emphasize these fundamentals we must not be surprised if others mistake the mechanisms for the essence. We are very directly the custodians of an industrial philosophy which is distinctly a "quality product"; upon us devolves the obligation of keeping faith with and proclaiming the ideals of its founder. Is it not possible for us to get our message across so that administration can distinguish the sound from the superficial?

IV. Obligations and Future Problems

Some of the outstanding problems which must occupy our attention in the future will be outlined very briefly.

A. Production

One of the biggest problems ahead I believe is that of securing suitable foremen. Under the rapidly increasing complexity of modern business, in spite of the unquestioned advantages in attempting to meet problems of organization through instructional foremanship, there is going to be increasing difficulty in securing and training the right type of foreman. Not only the mechanical and managerial duties of securing maximum production at minimum cost, but also the increasing realization of the importance of the foreman from the industrial relations standpoint, is constantly emphasizing the necessity of training high grade men for these key positions.

I believe that with restriction of immigration the question of the better utilization of such unskilled labor as we can secure, and particularly the devising of labor-saving equipment and methods to make up for an inadequate supply of common labor, deserves intensive study.

I feel that the question of fatigue must be given additional attention for the proper determination of rest and delay allowances. There is needed here the combined efforts of the production man, the industrial physician and the practical psychologist.

As regards mechanisms, the period of competition which we are entering will force the development of effective and more expeditious means of control, and new mechanisms of real value will undoubtedly continue to be devised. Simply to mention one such apparatus, we find need today of more adequate methods of determining the order of work and thereby securing a better machine and departmental balance, in plants doing a miscellaneous jobbing or made-to-order business. Closely related to this is the need of further intensive study of lot sizes.

B. Distribution

The importance of cutting down as far as possible the extremely high expenses of selling must not fail to receive more intensive study than is generally given it today. There are to be sure a few pioneer firms which are making real headway, but any one firm or group of firms can have but limited effect except by way of example on this truly national problem.

In a report of the Joint Committee on the Agricultural Industry, [37] it is shown that of each $1.00 spent for many articles in the United States in 1921, less than $.50 in many cases represents the cost of the finished product ready to sell. The conclusion of the Commission is that we have outgrown our whole distribution system. The insistence of immediate service in every case where it is at all practicable has made manufacturing to order practically a thing of the past. The problem confronts us as to the means by which the increasing cost of production and warehousing pending the customer's demand is to be met, and to what extent field assembly plants can relieve the situation.

C. Finance and General Administration

A further standardization and simplification of materials, and of varieties and finish of product, needs the detailed attention of factory executives.

Questions of seasonal industry, continuity of employment, unemployment insurance, service bonus and pension systems, and the general coralling of the business cycle, must continue to be studied in a scientific manner.

Industrial relations problems must continue to be investigated in a sympathetic manner. Since these problems probably cannot be permanently solved, it is therefore incumbent upon us to devise more adequate means for adjusting differences currently as they occur.

Our relations with organized labor, which has shown a very much more open-minded attitude toward the Scientific Management movement during the last few years, must be fostered. I believe one of our great duties is to minimize those seemingly irreconcilable points of differences which may remain, and to cooperate in the solution of common problems. We have an excellent opportunity to help in persuading organized labor that it is its duty to allow and persuade the individual to produce up to his individual ability. In order to secure that organized labor must have confidence in our motives as respects both the group and the individual.

The following striking excerpts from the Resolutions of the American Federation of Labor have the ring of sincerity:[38]

"Industry must organize to govern itself . . . . It must bring order to itself constructively or it will have an order thrust upon it . . . .

"It is not the mission of industrial groups to clash and struggle against each other.

"Facts must take the place of opinion and selfish interest.

"Labor stands ready for participation in this tremendous development."

Are we willing to help them?

We as a Society have not, I feel, utilized as we might the many educational institutions which are giving courses on management. I believe that in a few years the profession of management will be generally recognized, and that our future managers will be expected to have had training in this, as in other professions. It is our obligation to see that the part which the schools of business play in this training is based on thorough understanding of what really constitutes sound management.

A prime educational duty before us is to foster the increasing readiness on the part of the banker to look beyond the balance sheet. It is only through a wider dissemination of truly scientific and broadminded methods of industrial management that we may hope to secure united action in bringing about more enlightened administration of national and international affairs.

Related to this subject is that of the measurement of management. We have yet barely scratched the surface in this respect, and although the measurement of the *art* part of the management can never be exact, yet that part which is scientific has not yet had applied to it satisfactory yardsticks. In this connection the general question of executive reports needs further study.

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[37] Reviewed in *Scientific American*, December, 1923.

[38] *American Federationist*, November, 1923.

One of the really big questions we must face in the future is that of getting back more nearly, not to the one-man organization itself, but to the essence of it so far as coordination, control and personal touch go. The manager in one-man organizations has many advantages in these respects over the manager of large plants. As soon as a manager is forced to sub-divide his duties and departmentalize his plant, he loses much in control which he formerly held. Recognizing that this specialization is necessary in large establishments, it then becomes a matter of prime importance to set up some means by which this unified control and personal touch may be restored.

Finally, as regards our responsibilities as managers, I wish to quote the manager of one large establishment—an establishment to which we commonly refer as being one of the very finest examples of the application of Taylor principles and methods of management. In reply to my question as to the probable future trend of developments in his plant, he writes:

> The most important development in our management methods in the near future will probably be improvement in management itself. We have an idea that in general the efficiency of the management is less at the present time than the efficiency of labor.

Business Meeting

THE annual business meeting of the Taylor Society was held in the Engineering Societies Building, New York, January 24, 1924. The first order of business was a report of the letter ballot for officers for the year 1923-1924. The balloting resulted as follows:

President—	Richard A. Feiss	420
	Scattering	5
Vice-President—	Percy S. Brown	416
	Scattering	6
Treasurer—	Edward W. Clark, 3d	423
Directors—	Mary VanKleeck	412
	Wm. B. Ricketts	411
	Scattering	10

Then followed an informal report by the Managing Director concerning the affairs of the Society; after which the Treasurer's report was presented and explained. It was voted that the Treasurer's report be accepted and placed on file. This financial report will later be printed and sent to members. The last order of regular business was the election from the floor of the Nominating Committee for the coming year. The following were elected: Richard H. Lansburgh, Philadelphia, Chairman; Wm. H. Leffingwell, New York City; Henry H. Farquhar, Cambridge, Mass.; Robert J. Andersen, Auburn, N. Y.; Howard G. Benedict, Hornell, N. Y.

The remainder of the business session was devoted to a general discussion of the affairs of the Society, the problem of membership promotion receiving especial attention. No motions were presented.

MORE and more it is becoming necessary (in buying an industrial security or participating in the refinancing or reorganizing of an industrial) to examine into the labor situation; the supply of labor and the quality available, living conditions and cost of living, the history of existing labor difficulties, whether the business operates under the open shop or closed shop plan, the method of payment for labor, the average earnings of the labor in comparison with past records and with the average earnings of similar labor in the vicinity, and the relations between the management and the working force. (F. G. Coburn, *Financial Investigation of Industrials,* in Harvard Business Review, January, 1924.)

THE day of the so-called "desk-hand" is passing, as his work becomes more specialized and even professional. The Costing and Planning clerks are clearly engaged in occupations calling for more than routine ability. With the development of the Facilitative functions, clerical work is rapidly becoming the stepping-stone to positions in the management—not the management of manufacturing departments, but of the functional activities supplementary to manufacturing. Modern developments indeed indicate that, at a guess, some 50 per cent of the managerial positions in the industry of the future will need to be filled by men trained and qualified in various branches—statistical, analytical, investigational, and coordinative—of clerical work. This tendency places clerical work in a new light. (Oliver Sheldon, *The Philosophy of Management,* p. 276.)

The Influence of Scientific Management Upon Government—Federal, State and Municipal[1]

By **MORRIS L. COOKE**

Consulting Engineer, Philadelphia

GOVERNMENT perhaps even more than industry is in the unsystematized state. However, in view of the relatively small progress made by private industry in appropriating the philosophy and principles of Scientific Management, it is not strange that the introduction of system and science into public work comes so slowly.

In any such inquiry as that assigned to me we should be quite as much interested in studying out broadly the causes of failure as we are in citing specific illustrations of success. By far the most potent reason for such inferiorities as are found in our government appears to lie in the fact that the interest of the average individual in government cannot be very great as contrasted with his interest in his home and his work. For the contact of the great body of citizens with government is at best intermittent and finds expression only in isolated acts such as voting, paying taxes, rendering jury duty and military service. In addition to their intermittancy the character of these contacts is not such as to give the average citizen any sense of proprietorship in or responsibility for the results achieved. In this condition, I take it, lies our greatest difficulty in making government conform generally to our ideals and in having public work done in a manner that will stand close scrutiny.

In education we are coming more and more to build on an existing interest rather than to set up even what we might consider an ideal curriculum, if respect and desire for it must in any large measure be cultivated in the pupil. And so in private as well as public affairs progress appears to come through utilizing at least a genuine, even if not a sustained, interest rather than through appeals to tradition, authority or duty.

Therefore, without any abatement in my personal interest in or endeavors toward the improvement of municipal government, I have come to feel that the result of any direct attack upon this group of problems is bound to be disappointing. On the other hand, there are good grounds for believing that improvements in government—municipal, state, national and international—will come about quite naturally and inevitably as a result of the development of a well-ordered but democratic organization for industry, and perhaps only in that way. We have the workers' day-to-day and sustained interest in industry. If through arranging for the worker some responsible share in the conduct of industry he can be led first to understand and then to have confidence in justice and order and effectiveness in industry, and to appreciate their relation to democratic control, sometimes called consent, then and then only I believe will the workers by hand and brain demand and know how to get the same things in government.

If, as I believe, Scientific Management is both a spiritual and material force that must ultimately conquer and humanize the industrial machine, then it, in so doing, is in the way of making a very real contribution to government. For a democratized and effective industry will mean good government. Speaking quite broadly, we today see in the methods of our government hardly more than a reflection of the methods of business. The moral and other levels of public and private life are usually pretty much the same. But I believe that we can raise these levels more surely through an attack on industry because that is where we have the major interest on which to build.

There are, however, many other causes advanced for the failure of Scientific Management to make progress in government which to me seem distinctly secondary. For instance, one friend writes:

> Scientific Management is seldom given a fair chance in the affairs of government and for two principal reasons; first, the absence of strong central directing control, and second, lack of continuity of tenure.

Neither the "big stick" nor the continuance of any individual or group of individuals in office seem to be of the essence of the controls of the future. The bases of these controls will be found rather in the understandings and hearts of those whose collective action it is sought to make effective.[2] The strong man —especially one of the "go-getter" type—is too apt to interpret accomplishment in terms of his own purposes. As public, quasi-public and private business become more and more devoted to the accomplishment of social ends, and socially minded men and women given the places of leadership, less emphasis will be placed on the "strong central control" and more on making certain that every individual knows what the plan is, and further, and quite as important, what is to be his or her part in its execution.

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[1] Paper presented at a meeting of the Taylor Society, New York, January 26, 1924.

As for "continuity" we certainly find nowhere in private industry a more extreme type than in government. Some of the ways in which this principle expresses itself are grounded on the bitter experience of countless generations. In industry the passing whim of the man at the top may reach to the pettiest detail of administration to change or to abolish. But not so in government When our leaders learn to understand and to use and not to chafe at this "carrying on" spirit in government, great things may result.

Again we hear that "our government is one of checks and balances," that "we have too many laws" and that the Civil Service affords too little latitude in the matter of hiring and firing. All these things are supposed to operate against the introduction of Scientific Management. Of course, looked at in one way they do. But Frederick W. Taylor's claim to greatness lies in the fact that he has handed the world a philosophy of work which is so comprehensive as to render futile such obstacles. We all of us paid too much attention to the passage of legislation forbidding the use of stop watches and the payment of premiums in arsenals and navy yards. It was good to express our disbelief in the wisdom of such prohibitions. But our insistence was carried to the point where decimal dials and a particular wage system were made to appear vital to and almost the equivalent of Scientific Management.

I yield to no one in the value I put upon Frederick W. Taylor's work as a world force. Further experience with human institutions only heightens my admiration for the completeness of the demonstration he gave of the possibilities of his philosophy to affect human affairs, both small and large. Yet it is quite clear that something in the way of an apology is due in making an attempt within such a relatively short time after Mr. Taylor's death to trace out concrete effects of his work and philosophy upon operations of government. Anyone who knew both the inate modesty of the man whose work we are gathered here to study and appraise, and his almost too complete dependence on factual data as contrasted with the "hunch," will recognize in the task which has been assigned to me one in which Mr. Taylor himself would have had at best only an indirect interest.

But even if it is true that as contrasted with the whole field of governmental operations the instances of the specific application of these principles are few and sporadic, evidence abounds that consciously and unconsciously public officials and public administration all over the world *have* felt the influence of Taylor's work and philosophy. For instance, the Great War had not advanced very far when the verb "to Taylorize" came into quite common use throughout France as signifying effective administration. It was adopted to characterize what were considered improved, and more especially time-saving, methods in the home as well as in the larger affairs of commerce, manufacturing and government. Such a characterization in most instances denoted nothing that would be recognized by us as Scientific Management. But a study of Scientific Management in France conducted some years hence will probably show that much of the progress made in adopting these principles will have been due to indirect influences of this kind.

In an effort to make this paper representative of the best thought of a group, specially entitled to have views on this subject, I have sought the opinion of a number of men in each of two classes; first, those having had recognized contacts both with this movement and with government; and second, those simply having had special opportunities for observing government. As bearing on this general influence of Taylor's work note these comments:

William H. Connell[3]

The influence of scientific management has resulted in conducting public work on a far more intelligent basis than the basis upon which this work was conducted a number of years ago.

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[2] This word is used to permit the idea of growth as a function of every task. The word "efficient," which fortunately appears rarely in the proceedings of this Society, has a finality about it when used to qualify human acts which is not only repellant in itself but fails to recognize that every act and life itself is both a process and a preparation.

[3] Formerly Deputy Commissioner of Public Works, Borough of Bronx; Chief of Bureau of Highways, City of Philadelphia; and Engineering Executive, Pennsylvania Department of Highways, Harrisburg, Pa.

I have been familiar with public work for about twenty-five years, and my recollection is that the great advance in the method of handling public work started about 1908. From this time on the "rule of thumb" or the "hit or miss" method gradually gave way to more scientific planning and methods of conducting the work.

Two classes of work with which I am most familiar are highway and street cleaning, and in these branches of work the influence of scientific management has unquestionably raised the standard of the work both from the standpoint of the planning and the methods employed in the execution of the work.

Herbert D. Brown:[4]

The operating efficiency of many Government offices has been materially improved by utilizing other (than time and motion study) of the principles of scientific management, such as the routing, planning and control of work, which were so ably advocated by Mr. Taylor.

Clyde L. King:[5]

Frederick W. Taylor dedicated his life to getting a fact basis for industrial management. Industry he found had been conducted too largely on the basis of hereditary motions. Government likewise has usually functioned along lines of hereditary notions. In Government prejudices may persist longer than in industry because industry has the drive for profits to hobble preconceptions. With the development of a fact measurement for conclusions in industry came in time a tendency to apply fact measurement to conclusions and methods in Government. There can be little progress toward competency in Government until we get a fact basis for policies in Government. This is the great contribution Taylor made to public service.

Scudder Klyce[6] expresses the idea of the pervasiveness of the Taylor influence in public affairs in spite of the fact that only rarely does the record carry the evidence:

I am told that there exists no translation of Copernicus in English. Few people have read him. Few people quote him. And I understand that he made some errors—several bad ones. Nevertheless, Copernicus' general and perhaps merely implicit idea, that man and his earth was not necessarily the essential center and purpose of the universe, (1) was sound, (2) has become so thoroughly a part of most men's minds that we don't usually even bother to remember Copernicus and quote him explicitly as an authority, and (3) has in fact become *too much* a part of some men's minds, so that they overlook that we may, if we like, and can profitably in some circumstances, describe man and his abode as the center and important point of departure of the whole universe.

It seems to me to be the fact that Taylor's influence in our government has already become about as anonymous and hence truly authoritative or pervasive as Copernicus' general idea has become in men's thinking. He has affected government so much that he has already become an anonymous authority—his sound views have grown to be a part of men's customary thinking, which is taken as a matter of course, that requires no specific naming of authority.

Perhaps one of the best illustrations of this pervasive and general influence is the emphasis now being placed on our budgetary procedure. Frederick A. Cleveland,[7] a widely recognized authority on public administration and one who advocates the principles of Scientific Management, has been prominent in the fight for budgets for city, state and nation. His work on the national budget under President Taft and the classification work done later for the State of New York under the auspices of the State Constitutional Convention, he feels, "has left definite mark on the methods of accounting adopted by cities and states as well as the national government." The national classification of accounts recommended was covered in the Treasury circulars issued by the Comptroller of the Currency, Series 1912. While this particular series of instructions came in large part to be a dead letter, the general principles involved have since been "adopted and promulgated as part of the budget and accounting system." Perhaps no other single mechanism of public administration is doing more to bring order out of chaos than the budget, yet Mr. Taylor opposed it. He recognized the great opportunity offered to government for making contrasts between the accomplishments of different units in the matter of costs unhampered as is the public business by any necessity for secrecy considered more or less essential to private enterprise. Mr. Taylor felt that the budget proposed by Mr. Cleveland and his associates would stand in the way of real cost accounting. Public budgetary procedure is quite crude as compared with the industrial budgetary procedure recently so much discussed in our proceedings by John H. Williams and others. Jobs rather than work units constitute the coinage. Cost data result from special studies as in railroad practice[8] and do not "come off the books."

In this connection I recall a remark made by a former minister to China who, in contrasting the attitudes of the Chinese and American peoples toward their respective public officials, said that the Chinese expected their officials to do the right thing, and if events proved that they had not done so they would be summarily disposed of by cutting off their heads. We Americans, he thought, rather expect our public officials to be incapable and at times dishonest, and so we find ways to tie our public servants by hand and feet before they have the opportunity to go wrong. The budget has always struck me as a very refined, even if necessary, handicap to able administration. We shall undoubtedly work through it as we are working through the legalistic graft-preventing conception of Civil Service, sometimes called the Merit System.

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[4] Chief, U. S. Bureau of Efficiency, Washington, D. C.

[5] Secretary of the Commonwealth, State of Pennsylvania, and until recently Professor of Political Science, Wharton School, University of Pennsylvania.

[6] Author of "Scientific Management and the Moral Law," *Outlook*, November 18, 1911; author of "Universe," 1921; etc.

[7] Chairman, The President's Commission on Economy and Efficiency, organized by President Taft.

[8] See "True Cost-Finding—What It Can Do for the Railroads"; Morris L. Cooke, *Annals of American Academy of Political and Social Science*, November, 1919.

A concrete example of the application of broad Scientific Management principles in the municipal field is to be found in the new central station of the Water Bureau of the City of Philadelphia at 29th and Cambria Streets, from which every activity having to do with the distribution of a 450,000,000-gallon daily supply is directed and controlled. It is probable that those who have had orthodox training in Scientific Management will not find at this station a single familiar mechanism.[9] But I can recall no more beautiful illustration of the value of standardization, functionalization and centralization. The work involves the operation of countless thousands of miles of water pipe ranging from 60-inch street mains down to the smallest sizes used in houses; say 75,000 street stops; over 100,000 meters, etc. The work is subject to all manner of variations due to location, pressure, character and age of construction, and emergency service—such as for fires, quality of the water, etc. Formerly this work was handled from eight separate so-called Purvey Districts equipped largely with horse-drawn vehicles, manned by a non-functionalized force, almost entirely without the aid of written records and using for the most part non-standardized equipment, tools and supplies. Credit for the development which has been brought about during a period of at least ten years is fortunately well distributed among a large number of employees. The underlying principles have been bred into the personnel through many short steps and simple illustrations spread out over years of patient work. There is apparently no party of the opposition "waiting to throw the blankety-blank thing out."

An interesting phase of this work[10] is that it is leading slowly but I believe surely to inter-city standardization. At present I believe this only involves meter practice. But the principle once established, its application is sure to spread.

An illustration of a more orthodox application of Taylor methods in the work of Philadelphia's Water Bureau is found in the work done by Sanford E. Thompson in cleaning filter sand.[11]

In commenting on all this fine work Carleton E. Davis, Chief of the Bureau, who afforded the inspiration for and generally directed the changes, has recently said:

> Our experience is an illustration of the fact that "the letter killeth," but the spirit of Scientific Management was the great influence which brought about the changes in the Water Bureau during the eleven years of my connection with it. Scientific Management influenced the animate, as well as the inanimate.
>
> The hope of reward stimulates us all. The reward may be pecuniary, or it may be the satisfaction from a job well done. We all react to influences of good order and reasonable system. Scientific Management does bring a definite reward along some line, as a result of a job done better than heretofore. There is always the future in view—a Tomorrow, as well as a Today.
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> In saying this, I find my mind reacting to the broad influences radiating from Mr. Taylor's work, rather than dwelling upon any specific case of detail. I attribute to him, and to the work that he did, general principles rather than detailed application of these principles in any one instance.

My attention has been called by Henry Bruère[12] to attempts made in New York City "to specify the individual operations in sewer and sewer basin cleaning." He tells me that "a number of the practices are still in operation."

Because it affects county government, mention should be made here of the efficiency and economy survey which was started late in 1922 by the Board of Commissioners of Cook County, Illinois, under the direction of J. L. Jacobs, for many years a member of this society.

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[9] Taylor never claimed originality or special virtue for many of the mechanisms he used. But during a period of over thirty years Taylor assisted by a considerable number of more than average men worked to build up a consistent grouping of mechanisms which taken as a whole yield results not obtainable except through using some grouping of mechanisms similarly developed. It is only human to want to develop "for ourselves" and therefore necessarily anew. Some years hence, after it has been discovered what an opportunity and necessity there is for dovetailing and interlocking of mechanisms in management, there will develop a greater interest in knowing how Taylor did it. For this reason I hope our society will make plans for carefully filing every paper and other means of recording the details of Taylor practice.

[10] I understand that this work has been quite fully covered in an article by Seth M. Van Loan about to appear in *Engineering News*.

[11] See "A Study of Cleaning Filter Sands with Opportunity for Bonus Payments," by S. E. Thompson, presented at the Annual Meeting of A.S.M.E., December, 1914.

[12] Formerly City Chamberlain, New York City, and distinguished pioneer in the crusade for better government in American cities.

Another piece of work which I feel may fairly be credited in its conception and execution largely to Mr. Taylor's influence, and which is leading to cooperative effort between widely separated governmental units, is Mr. Hoover's work directed from the Department of Commerce toward standard specifications for State purchasing agents. Mr. Hoover's address delivered at the conference on May 26, 1923, is a classic on standardization. This work and Mr. Hoover's efforts toward "simplified practice" in industry were in no small measure inspired by the "Waste in Industry"[13] inquiry conducted under Mr. Hoover by a committee, a majority of the members of which are recognized advocates of Scientific Management.

Of a distinctly different character is the personnel work in the Post Office Department initiated by Postmaster General Will H. Hays and now being carried on under the leadership of our distinguished Past President, Henry S. Dennison. There has been organized something akin to a works council in the Department as a whole and in each of the larger post offices. In a recent letter Mr. Dennison said:

> When I took up the work at the end of 1921, I followed along the health work[14] as vigorously as possible, but, of course, put my back also into the job of getting the councils solidly established. Because I don't believe that a council lives very long as a mere grievance or a merely representative body, I persistently urged thorough investigation and consideration of the actual facts which lay behind such questions as were brought up. This sort of work has encouraged the investigation habit in facing labor problems. With over a thousand councils in existence, there have, of course, been thousands of specific cases that have been studied and studied analytically rather than merely "debated".
>
> The name of the official directing this work has very significantly been changed from Welfare Director, as first appointed, to Service Relations Director, which of course corresponds to the Industrial Relations Director used in private concerns.
>
> Our work has been quite along the usual lines. We have helped to develop a magazine for the whole service, we have recommended the easing of the standing position for distributors and a properly designed stool for them to sit or rest on, we are studying a manual of training for those about to enter the service and for those in their first year, and so on. The difficulty about naming any of these things is that in so huge a project they are all, of course, of very slow development and quite in the nebulous state as yet.
>
> A notable independent achievement of the Letter Carriers' Association is their determination that their jobs should be analyzed . . actually 'time studied'[15]. . in order that proper standards may be set and enforced. They hired the Labor Bureau, Inc.[16] to advise them and they accepted their findings in a report which received very broad approval.

Hollis Godfrey[17] suggests the adoption by government of one of Mr. Taylor's practices which was particularly useful during the Great War, as follows:

> There is one side of Mr. Taylor's work which I have never seen expressed and which is of supreme importance in its effect upon governmental procedure as well as upon industrial practice generally, i.e., his insistence upon the written record. In an experience with the government which involves seven governmental appointments in five different divisions of the government over a period of some nine years I saw nothing more significant than the constant advance in selective written records on industrial matters, much of which I am sure was due to Taylor's work.
>
> In the early years such records as were made of industrial processes were historical. They were not used as guides for the future. Taylor insisted that the written record should be so made that it could be used as a guide to future procedure; and I believe he was a pioneer, if not the pioneer, in such insistence. The effect of his work in this respect on the processes of government can hardly, I believe, be overestimated. I have always felt that this was the point which should be stressed. It has seemed to me that in reviewing Mr. Taylor's work, many of his outstanding achievements such as this have been neglected, and that material of infinitely less permanence has been emphasized.

Both our Army, through the conduct of some of the arsenals—especially the one at Watertown, Mass.—and the Navy, through the espousal of Taylor methods by its Construction Corps and individual line officers —notably Admiral Casper F. Goodrich—have been fundamentally affected by Scientific Management.[18]

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[13] "Waste in Industry"; McGraw-Hill Book Co., 1922.

[14] Started by his predecessor, Dr. Lee Kaufer Frankel.

[15] "Time study" as here used, and as it is ordinarily now used by the layman, has no very technical significance. Even the use of a stop watch is not necessarily implied. It includes frequently features of job analysis, motion study and other practices having fairly definite technical significance. It includes the ascertainment of all the details and facts about any given job that may be ascertainable.

It is the urge for justice which more and more is leading labor to demand *measurement* of work as *one* basis for wage payment. Justice as between individual workers in dividing financial returns is coming to be seen as only secondary to the division as between capital and labor.

[16] The Labor Bureau, Inc., 2 East 43d St., New York City.

See its report "Supervision of the City Delivery Service," to the Postmaster General, May 26, 1923.

[17] President, The Engineering-Economic Foundation, Boston; formerly member National Council of Defense.

[18] See article "Secretary Newberry and Navy Yard Reform" in *North American Review*, 1909, by Casper F. Goodrich, Rear Admiral, U.S.N.

The work done in both branches of the service is ably and comprehensively reviewed in Vol. II, Chs. 11 and 12, of the Copley biography.[19]

Because of the ability with which it was directed and the complete establishment of the worthwhileness of the results obtained, even more than because of the long continued controversy to which it gave rise, the work of General William Crozier stands out as one of the most valuable contributions made to the Scientific Management cause.[20] The high level reached in the management of the Ordnance Department during the war was due almost entirely to the acts and influence of this splendid officer and man.

Because of the picture afforded of the present status of scientific management work in some of our principal navy yards, I quote from a recent letter from A. H. Van Keuren, Commander, U. S. N.:

> My introduction to the system was through Hathaway at Philadelphia about fifteen years ago, when his guiding hand was felt in the Central Tool Dressing Plant on which he worked with James Reed. It must have been Hathaway's enthusiasm that led us at that time to start a Planning and Estimating Section at Philadelphia, which later expanded into the present organization.
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> When I left Philadelphia and came to Mare Island in 1911, I found that Holden A. Evans and his disciples had become firm converts to the Taylor System and had left behind them a well organized Central Planning and Estimating Section with a smooth running routing system, shop planning, etc., and with the Halsey Premium System in full operation in the Flag Loft, Sail Loft, and Boat Shop. It was an education to me in management and as Shop Superintendent, I planned to extend the working of this system to the Sheet Metal Shop, Shipsmith Shop, and elsewhere that it seemed applicable. In this I had the hearty support of Naval Constructor Ruhm, then Construction Officer, and of Naval Constructor Gleason, his successor. As you know, however, these plans were handicapped when Congress refused to spend any part of the Naval Appropriation for work involving the use of a stop watch, time studies, etc. Although premium systems passed out, the results of all the work put into them are yet fruitful in setting up standards that we know can be lived up to.
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> In 1916, I went to the Bureau of Construction and Repair and for four years, before, during, and after our participation in the World War, was connected with design work. While not so evident as in a Navy Yard, the principles of scientific management were in use in the Bureau during those trying times and such men as Furer, Ackerson, Henry, and others could scarcely have carried on their burden of work without being able to organize, schedule their program and keep intelligent progress reports of field work and without their knowledge and training in correct principles of management. I know they sought advice from leading industrial engineers and welcomed eagerly any suggestions that might tend to the sole object of their lives at that time, ships—and yet more ships.
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> In 1922, after two years in the New York Yard, spent first in starting the building of the South Dakota and Indiana, both stopped after the Washington Conference, afterwards as Outside Superintendent, in both of which jobs it was attempted to utilize the best systems evolved for Navy Yard work,—though not always with success, due to lack of funds—I return to Mare Island, to find much the same organization that existed six years before.
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> There is no question but that millions of dollars have been saved by the application of Taylor principles to the varied work of Navy Yards, even though such application in many instances has been far from thorough. It is impossible to gauge the cumulative effect of the absorption of a few correct ideas in the minds of a number of responsible persons in Government employ. If the result is merely to make them receptive to suggestions along the line of systematizing their work, the gain is incalculable. If, to add to this, they reach the pitch of enthusiasm where they begin to spread the doctrine, the chain is endless. I wish I could state that the portions of Mr. Taylor's "Principles" we have learned and applied in the past have been maintained and extended in Navy Yards down to the present time. Unfortunately, such is not always the case. The main principles of organization have usually survived, but many important details have fallen by the wayside due to lack of appreciation on the part of those responsible for appropriating funds. Any outlay not directly contributing to so-called "productive" labor has often been looked on with suspicion and expenditures therefor curbed. In spite of handicaps, however, the improvements that can be noted since Mr. Taylor's philosophy began to permeate to Navy Yards are striking, and step by step major items of improvement are still being made. It must be admitted that at one time, due to a flood of literature on the subject, and the pretensions of a lot of incompetent "efficiency engineers," many government officials became distrustful of the whole movement, but now with a subsidence in ill-advised advertising, and the accomplishment of improvement without so much use of the word "efficiency," thoughtful executives are turning again to a study of the Taylor principles.

It sounds trite to say that some undertakings which are fairly complete failures as regards the accomplishment of their more immediate purposes are brilliant successes in the light of their influence on subsequent events. It will be some years before we shall see the full effect of the splendid efforts made just after the war by our own fellow member, Otto S. Beyer, representing the administration of the Ordnance Department, and by our highly respected and genial cooperator, R. L. Cornick, who represented the Rock Island Arsenal workers, to stabilize employment at the arsenals and in the navy yards and to effect such stabilization under conditions which would enlist the fullest possible interest of the workers in effective production. With the signing of the armistice, of course, work at these government manufactories came almost to a standstill. Then the proposition was made that a reasonably full peace time organization be kept engaged on making articles required by other departments of the Government. The saddlers at Rock Island would make the leather mail pouches for the Post Office Department. The workers agreed to do everything in their power through a detailed study of manufacturing methods and costs—even to employing expert assistance—to make it possible for the Government to have its requirements satisfied at the lowest possible cost. Simply because the Government was not in competition with anyone else it seemed to afford a field where labor was without any excuse for doing other than its best. Opposition originating from two quarters—first, from manufacturers previously supplying to the Government the articles it was proposed to manufacture, and second, from officers of the Army who sincerely feared the encroachments of organized labor on the discipline of the department—ultimately caused the abandonment of the scheme.[21] But much good has come of it in a better understanding between the organized workers and the technicians as to the field and function of Scientific Management. These experiments in cooperation between men and management, together with efforts along the same line a little later on the railroads, was one of the influences leading to the organization of the Labor Bureau, Inc., which so far as I know is the first continuing agency organized to provide labor with technical information about industry interpreted in the light of the labor philosophy. Not only for its historical interest but because of the wealth of information it contains bearing on this general plan, I wish this society could obtain for its library from the International Association of Machinists a report made to that organization in May, 1922 by O. S. Beyer on "The Intensive Utilization of the Army and Navy's Industrial Facilities."

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[19] "Frederick W. Taylor, Father of ~~Scientific~~ Scientific Management," by Frank B. Copley, Harper Bros., 1923.

[20] See address by General Crozier, U. S. A. delivered before Philadelphia School of Commerce and Accounts and reprinted in *Taylor Society Bulletin*, October, 1915; also Senate Document No. 800, 63rd Congress, 3rd Session.

In the same sense that necessity fosters invention, in the face of danger individually and collectively we are prone to utilize means admittedly effective which for one reason or another we disregard or purposely ignore when nothing threatens. Viewed from this angle the many, many ways in which our Government utilized the mechanisms, personnel and principles of Scientific Management when confronted with the task of making the largest and quickest contribution to the defeat of Germany is the best possible augury that in due time these methods can be made current in our everyday, peace-time affairs. Even to catalogue the distinguishable efforts which taken together constitute the contribution of Scientific Management to the winning of the war would be a lengthy task. Perhaps some day it will be done. It would be especially valuable to the nation if someone could record the work done by the late Henry L. Gantt and Hudson W. Reed in the early days of the war in the matter of developing follow-up methods. This work was of such a high order that all subsequent work in the same field was measured by it.

I know of very few contributions to the success of our American war effort which compare in originality, succinctness, practicability and importance to that made by our fellow member Henry P. Kendall, first in discovering the entire absence of any provision for storage facilities in our war plans, and then in moving as a private citizen, but nevertheless effectually, to have the omission rectified. It was a notable piece of work! At my request Mr. Kendall has described the early stages of this effort as follows:

> In the latter part of March, 1917, just a week or ten days after the Council of National Defense was formed, I returned from the South and stopped off in Washington and circulated among several of the members. I discovered that they had taken into consideration and had attempted to organize so as to cover such matters as transportation and purchasing of materials, but had failed to consider that without provision for storage and without any place to which to ship and assemble and from which to distribute large purchases they would be in a very bad mess. It was at that time that I conceived the idea that the manufacturers of the country who had a common knowledge and experience of stores methods might cooperate in a movement to develop storage facilities and supply the organization and supervision. Our first meeting was held on a Sunday morning at the Bellevue-Stratford Hotel in Philadelphia. Those present were convinced of the emergency and took train for Washington. Later I brought together at luncheon a group of prominent Eastern Massachusetts manufacturers who were in hearty accord. Afterwards a similar luncheon was held at the Engineers Club in New York. These activities, I think it fair to say, established the idea in Washington and caused the appointment of a Storage Committee in the Council of National Defense under Frank Scott, later taken over by the War Industries Board.

Thus was started an effort which resulted in an expenditure of over $300,000,000 in warehouses and other storage facilities.

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[21] We are informed that this work has not been without permanent effect on the operations of the arsenal.

It was absolutely necessary during Mr. Taylor's lifetime for him to battle in and out of season not only for the maintenance of broad principles but quite as much for the scrupulous observance of details, some of them seemingly quite unimportant. By means of a fine mind, broad sympathies, a wide range of knowledge, a willingness to spend and be spent, a never-suspended unwillingness to compromise, and by other means, he built up an integrated philosophy of work adequately expressed at many places by appropriate mechanisms. In the face of opposition from a thousand quarters he made his demonstration. The world accepted his thesis as much as it ever accepts the work of innovators. And then the Great War came and we saw all that Mr. Taylor had stood for in production proved out on a gigantic scale. Opposition to Scientific Management rightly conceived is no longer heard in responsible quarters.

So I end with the plea for tolerance for those who want to move slowly in this general direction. We must have more patience with our friends who have the responsibility for leading labor. They are well advised to question our philosophy—to weigh it from every angle. Perhaps even more patience will be needed in winning the business man burdened as he is with the insistent demand for immediate as contrasted with future profits. We must more and more stress the broad principles and expect to see these voiced in a variety of mechanisms with which we are not familiar. The day of propaganda for Scientific Management is past. The realization of Taylor's great vision has just begun.

ORGANIZATIONS have their photographs taken through the preparation of organization charts. These set down on paper the structure of the organization, by indicating positions or departments, and then showing the lines of supervision between them, as well as frequently definitely stating under each position or department the responsibilities attaching thereto. As shall be seen, organization charts, like other photographs, are not wholly satisfactory, inasmuch as many little details and inter-relationships of live, operating organizations cannot be properly pictured on a chart. But the most satisfactory way of studying modern organization development is through the utilization of a typical organization chart. In studying such a chart it is well to remember that the titles given individuals or departments in various enterprises vary with the whims of the organizer, even though the duties performed be essentially similar. Therefore, it is well always to make sure that seeming great differences between two organizations are not merely differences between the titles of the individuals or departments in question. (R. H. Lansburgh, *Industrial Management*, p. 72).

IF MANAGEMENT is to stand for this new motive, the manager of the future must be of a new fibre. Technique, disciplinary power, accuracy and reliability in work will no longer be his primary qualifications. The first requisite must be the gregarious instinct, the instinct for cooperating with other men, attracting them to him, welding them together. He must be less of a technician and more of a "captain"; less a "boss" and more of a leader. Being loyal-hearted he will inspire loyalty. Being intimate with his men he will gain friendship. By appreciating subordinates he will enlist their support. By being a captain he will form a team. He cannot be passive; there is no half-way between hostility and cooperation. He cannot hide what he is. The factory is a compact corporate consciousness, which resents deception or concealed motives. Indeed, the more scientific the factory organization, the greater is the opportunity for management to spread its example and disseminate its spirit, and the greater, too, the opportunity for the workers to detect dishonest motives and paltry ideals. (Oliver Sheldon, *The Philosophy of Management*, p. 196.)

Scientific Management and Personnel Work[1]

Why a Scientific Management Plant Offers the Proper Environment for the Highest Type of Personnel Work

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Eight years ago at a meeting of the Taylor Society held in memory of Frederick W. Taylor, Mr. Richard Feiss delivered a paper on "Human Relationship as a Basis of Scientific Management." I have been impressed in reviewing the progress of the intervening years with the fact that though our practices have naturally been modified, the policies and the principles which underly our methods are the same now as they were when Mr. Feiss's paper was written. Certainly this is proof of the basic soundness of Taylor's fundamental philosophy and of its enduring qualities.

TO ONE who has lived through years of controversy concerning Frederick Taylor and his theories of labor management, it is most gratifying to see how the sane, sturdy principles which he so unflinchingly upheld are at last seeping through all circles and shades of opinion as the fundamental bases of sound industrial health. Within a short period of time I have heard a noted labor leader and a well-known social worker who is usually conceded to be a sentimentalist on industrial subjects, pay enthusiastic tribute to the man who courageously fought his way through the thick cobwebs of tradition concerning labor relations to a field of light.

It is both amusing and annoying to observe how many of the controversialists on the subject of Taylor's attitude toward workers have blithely and glibly condemned him without going directly to his works to discover firsthand what was his underlying philosophy. During a red letter evening I recently spent with the most inspirational teacher of my college days, Vida Scudder, she exclaimed, when we mentioned the unpleasant publicity some of her statements sometimes attracted, "Oh, my dear, it is an unfortunate thing to have too great facility of expression when one feels warmly on a subject, for newspaper reporters find it all too tempting to quote the more picturesque phrases out of their context." This, I believe, is what superficial minds have done in relation to Frederick Taylor. They have not taken the time and effort to dig into his writings and follow his philosophy through from start to finish. They have merely seized upon picturesque phrases which, dissociated from his basic philosophy, mean nothing. More than once I have hurled my lance at an industrial theorist who has vaporized concerning the "horrible reducing of men to automatons which Taylor advocated" and who has afterward acknowledged he had never read any of Taylor's writings.

It was Taylor himself who on many occasions warned his hearers not to confuse the essence and philosophy of scientific management with its methods. Yet there are still many human beings with an average endowment of brains who insist upon doing this very thing. Mechanism and methods were to Frederick Taylor of great importance but in the last analysis they were merely the logical and inevitable expression of underlying principles. The employer, however, who deals in lofty phrases such as "the right spirit," "the golden rule," "a generous heart" and other verbal opiates and then does not insure justice to workers by slowly and surely establishing machinery for this purpose, was just as much anathema to Taylor as the employer who installed time study and other mechanisms of scientific management without accompanying them with the "true philosophy of management" and without "a complete revolution in the mental attitude and habits of all those engaged in the management, as well as of the workmen".[2] Taylor unswervingly hewed to the line in insisting upon spirit and technique walking hand in hand, if building for the future and not merely for the present was to be the aim of industrial management.

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[1] Paper presented at a meeting of the Taylor Society, New York, January 25, 1924. A reprint of Mr. Feiss' paper, a companion paper referred to in the text, will appear in an early issue.

[2] *Principles of Scientific Management,* pages 130-13

Let us examine Taylor's underlying philosophy and determine as far as possible how it affects the happiness and prosperity of workers. In "The Principles of Scientific Management" he says, "Scientific Management, in its essence, consists of a certain philosophy which results in the four great underlying principles of management:

1. The development of a true science.
2. The scientific selection of workmen.
3. Their scientific education and development.
4. Intimate friendly cooperation between the management and men.

I. The Develop ment of a True Science

Taylor defines the development of a true science as "knowledge so collected, analyzed, grouped, and classified into laws and rules that it constitutes a science." There is no "get scientific quick" about any of the recommendations Taylor makes for the evolving of these "laws and rules." On the other hand, he advocates careful, accurate, painstaking effort in the work of *developing* a true science. Over and over Taylor deplores the tendency on the part of impatiently eager managers to plant a system before the ground is tilled.

In the matter of personnel work this is peculiarly important. Because of traditions concerning the "handling of workers" which have become encrusted like barnacles on many executives, major and minor, movement with the times in both the thought and action of these executives has been much impeded. Management, consequently, must assume the responsibility for scraping off the barnacles and exposing such executives to sunlight and fresh air.

Taylor had no use for the lazy manager. How many plants there are where the manager boasts he has selected competent men to supervise the various departments and that policies and methods are "up to them." There is a pretty little game of buck passing in most of those plants. Everyone knows that, in the final analysis, the manager is responsible for putting through certain policies and he need not delude himself into thinking that the workers do not hold him responsible whether he is on the golf links or in his office. And everyone knows that if this chap (who in pretty phrases tells people he is developing men by expecting them to do his job) wakes up to find himself and his plant in the rear of the industrial procession he will have only himself to blame.

For workers in plants as well as citizens in cities want constructive leadership in the development of a true science which will reduce chaos to order. Do not tell me workers do not like "system," which is their common expression for this science which Taylor says it is the responsibility of industry to develop. Many times have I heard the intimate expression of workers' opinions on this subject. Just a short time ago a very intelligent man left an assistant's position in our receiving and shipping department to become head of such a department in another organization at a much higher salary. In a few days he called me up urging me to let him have his old job, and when I saw him he was full of disgust with his new job because "The management didn't even know what the word system meant." He went on to say that there was something peaceful and satisfying about our place because it breathed order throughout.

Most human beings like order. And you can't have physical or mental order without a "true science." In my experience I have found that numbers of the applicants who come to us come because they hear that we have a "clean place," a place where there is "system" and where they can "make money and work up." If more plant managers had their ears to the ground there would be more applicants at their gates whether labor be scarce or plentiful. They would see the economy in spending time, money and energy on the "development of a true science" which would advertise the working conditions of their shops without the help of newspaper advertising and would repay them tenfold in securing for them a more desirable class of applicants as well as in reducing turnover. But the barnacles must be scraped off slowly—even off some managers. Count Korzybski flatters us by calling us humans time binders. Sometimes I think we need a little time study on time binding in order to speed us up a bit. We might then decide that we need no further experience to prove that workers like order and "system."

One of the greatest gains resultant from the analyzing and codifying of data is that where this is the practice there is constant questioning of present methods with an idea of improving them. And this questioning is not by any means limited to the higher executives in a plant. For when research and study on the part of people whose business it is to plan and methodize result in certain recommendations, there is no hesitation on the part of people affected by such recommendations to question them. There is, however, a vast difference between the plant where managers have at any time attempted to double cross workers or to put in "efficiency schemes" without careful and scholarly research, and the plant where the management has the reputation among the workers of being on the level because of a long history of conscientious work and of square dealing. In the latter type of plant, while the workers insist upon full and clear explanations of any new method or policy affecting them, there is a general spirit of giving new ideas a fair trial. In other words, suspicion is supplanted by a spirit of honest and cooperative experimentation.

Critics of scientific management often charge its exponents with crushing initiative in the worker. On the contrary, Taylor at various times urged the encouraging of workers to offer suggestions. But oh, ye suggestion systems! How much bunk has been perpetrated in your name! In house organs we read how Mamie Jones was paid for suggesting that a broken window be mended so the rain would not blow in on her machine, or how Tom Brown was awarded a few dollars for suggesting that a broken board in the factory floor be mended, or how Stazie Berenlov was honorably mentioned because she suggested that the lockers be properly ventilated. This is all very amusing to Taylorite executives and I feel safe in saying it would be more amusing to the rank and file of workers in Taylor shops. For they have learned to expect something of management and they are justly impatient if management is not awake to its responsibilities. They would not expect awards for suggesting that loose boards be nailed down, but they would raise a mighty howl if a plant were not so organized as to have such things discovered and remedied as a matter of course by people whose duty it was to discover and remedy them. So it is that one does not get in Taylor plants the piffling suggestions of this nature which delude many plant managers in rule of thumb plants into thinking their workers are exceptionally interested and responsible. But one does get, in scientific management plants, a fine sense of confidence on the part of workers which is born of the fact that they have evidence that management acknowledges its responsibilities for organization and execution of obvious routine.

In most scientific management plants there is what is known as standard practice which consists of an outline of plant policies and methods up to date. Please notice I say up to date. For workers would have but little respect for a book of law which bore the stamp of finality. Matters affecting human beings are seldom static; so standard practice must be a constantly growing and evolving thing as mechanical improvements come about and as ideas change. One of the greatest inspirations I received from Taylor when I heard his remarkable course of lectures in Boston many years ago was his reiteration of the basic philosophy of change and of the constant evolution from old to new. Many people have accused him of subscribing to a doctrine of rigid, cut-and-dried formulae but to those of us who know his real philosophy such a conception is absurd.

He did, however, recognize the fact which all of us who have intimate and daily contact with workers recognize, that while times change and men's ideas change, nothing can cause such widespread discontent as a variety of policies in the same organization at the same time. One policy, subscribed to consistently and sincerely, will do more to inspire confidence in workers than two policies, administered by two officials, no matter how earnest and honest both of these officials may be. There may be differences, and very honest differences of opinion, all up and down the line and through the various strata of an organization. But we all know we cannot run our cities by having one law for one man and another law for another man. Nothing causes so much scorn for law as any hint of lack of consistency in its application. And when once "knowledge is classified into laws and rules," as Taylor says, these laws and rules must hold until amended. Obviously workers have confidence in a management which does not waste time haggling frequently over matters that have already been discussed and satisfactorily settled for the time being. To anyone engaged in the complex routine of shop management the relief of being able to refer people who are confused over minor matters to "Standard Practice" is self evident. There are too many conclaves being repeated ad nauseam in our business organizations today over matters which should be codified and put in black and white. In thus codifying such material not only is time saved but workers are content in the conviction that various personalities do not apply rules and regulations affecting them according to the whims and fancies of the day. This is what John R. Commons means by "organizing for good will."

In some scientific management plants the importance of organizing for good will has been evidenced in employee representation as a means toward this end. During the past ten years experiments in this important phase of developing cooperation have resulted in submitting to groups matters which pertain directly to the interests of these groups. In this connection I would refer you to Mr. Feiss's paper on "Human Relationship as a Basis of Scientific Management" in which he stresses the fact that democracy does not consist of voting.

By a well worked out system of group representation there is an opportunity for thorough elucidation of all suggested innovations and changes and a chance for expression of management, foremen and operatives. The success or failure of such a plan, however, depends upon the earnestness of people in this great game of understanding each other, and that can be gained only by years of close contact and fair dealing. Its value lies in the publicity acquired by group discussion, the good will secured by group agreement and the sportsmanship which an organization governed by integrity can inspire in its members not only in the discovering of laws but in abiding by them. In some organizations disruption results from an insidious undermining of law by men, even in responsible positions, who are individualists and do not recognize the value of one law for all in developing group spirit and morale.

As a concrete example of such accumulating and codifying of material followed by group agreement on its method of application, I might mention what is known in most plants as "excuses." In our own plant excuses are granted (or refused) by a committee consisting of the shop representative (executive representative of the works council) and a member of the staff of the service department. Contrast the lack of method in the matter of granting excuses in the rule of thumb plant with the method in a scientific management plant. In the former a worker goes to his foreman and asks for a day off. Or, in many cases, he simply takes the time off and lies to his foreman on his return. In any case, the man is railed at or winked at according to the whim and nature of the foreman he approaches. One foreman may be rigid in such matters and another lenient. There is no plant policy. Decisions in such a plant are not arrived at by thoughtful examination of facts, agreement as to major methods, and a spirit of abiding by the law, but they are made according to different whims of different people on different days. We would resent our traffic conduct being regulated by traffic policemen in this way. What reason have we to believe it is more satisfactory in our work shops than on our streets? Take, on the other hand, the method pursued where there is "system." The worker applies to the excuse committee through his foreman, and the request is granted according to the validity of the excuse and the absentee record of the worker. The workers know that there is no favoritism shown by the excuse committee, but that this committee acts according to a common law evolved out of long standing experience and history of work records. Thus law is substituted for personality in decisions of this sort, and a sense of fairness on the part of workers is the result.

Again let us consider the example of taking up collections in an organization. If all groups agree that this is a habit which involves workers in difficulties, it goes into Standard Practice that no collection will be permitted for any purpose whatever. When a particularly appealing purpose arises and some individual wishes to take up a collection, it is not necessary to spend time discussing the merits of the case. The majority of workers would resent the violation of standard practice or even the waste of time involved in discussing a special case, the wisdom of not permitting collection-taking having been already conceded as a ***policy***.

There would be a clearer conception of the happy mean between centralizing and decentralizing shop discipline if such methods as I have been describing were employed more widely. As in the function of hiring, there is no feeling of "authority" in personnel workers whose duties include the consistent application of policies subscribed to by all. It was not until our Works Council recognized the need of a person who was freed from all other duties to serve as their executive secretary that its smoother functioning was brought about. It was like a committee without a chairman, or at least a chairman who had time and energy to devote the necessary attention to the business of the committee. Similarly an industrial organizations' personnel work becomes sooner or later tangled up with loose threads unless it is someone's especial duty to tie them in. To me it seems the *reductio ad absurdum* to conceive of each foreman handling many matters which by their very nature should be insured consistent handling by the same people. I have never seen a plant where corroding fear did not eat out the latent good will of workers if any individual had it in his power to discharge without a hearing or even to threaten discharge. In many minor matters of discipline, likewise, consistent practice must be assured. And I maintain that in a plant where every attempt is made to supplant personal policies by organization policies, the foreman is considered by his workers a real fellow and not a straw boss. But where there is fear of suspicion of unfairness (resulting from inconsistent practice) there is no room left for respect.

But it is not merely in matters which obviously fall within the range of the usual activities of a personnel department that employees gain respect for a management which stands for consistent policies based on honest investigation of facts. The work of every department in an entire plant affects the happiness and well being of employees. No one department may be said to have "personnel work" exclusively in its hands. Therefore, planning, machine maintenance, routing of materials and dozens of matters not usually regarded as affecting industrial relations are, in truth, at the very heart of such relations. Wavering and easily dispelled is the confidence of employees who are not convinced that their management does honest work in its practical school and stands at the head of the industrial class in all these matters which so affect their destinies at work and their prosperity at home. Here, again, one has only to listen to employees boasting of the advanced methods in their places of work to know that they appreciate a management which is earnestly dealing with facts and evolving just policies and methods from these facts.

It was Taylor's industrial creed that only by governing according to law based on facts could justice and fair play supplant favoritism and thus inspire confidence and cooperation in workers. Change for the sake of change, never. Change based on new light, thoughtful study, newly discovered facts and ever progressing ideas all of which result in bettering conditions and increasing the prosperity of him who directs and of him who is directed (both of whom must be conscientious *workers*), this is the keynote of the thing which Taylor calls "the development of a true science."

II. The Scientific Selection of Workmen

So much has been written concerning methods of selecting workmen that we shall step lightly over details of method and consider the philosophy underlying this second basic principle of scientific management. To those of us who have had much experience in selecting workers it becomes more and more evident that the selection can not be wholly scientific. However, it can at least approximate the scientific and that is more than may be said for the old hit-or-miss methods. By careful physical examinations, by mental tests, by constantly improving methods of selection and placement through analysis and synthesis of experience, one can at least arrive at a fairly satisfactory process of selection. But we must avoid making too enthusiastic claims and we must be constantly on the alert to analyze and correlate our theory and practice. Here, too, our experience leads us to believe that an employment department with a "system" which is put into practice by someone who is applying conscientious thought and energy to his job is another factor in stabilizing the confidence of workers. If a man in a plant without a definite employment policy wants to get a job for his brother, he thinks he can worm him in by cajoling the hiring clerk or getting the favor of a foreman (where foremen do the hiring). But if all the workers in an entire organization know that requisitions for workers are carefully supervised on the basis of manning operations and departments according to demonstrated need, and if they know that people are selected on the basis of their fitness for the organization and for the job as evidenced by a procedure of selection which is applied to all applicants, they are again more likely to concede that "pull" does not count. This attitude of workers exists where employment supervisors are not tempted even by executives in an organization to make exceptions in favor of their relatives and friends. For in a scientific management plant it is an accepted and settled-for-once-and-all fact that in the policy of selection of workers as well as in other policies, whim and opinion are supplanted by law.

Oliver Sheldon says in his remarkable book, "The Philosophy of Management,"[3] "There is little need to emphasize the necessity for employment work to be organized as a distinct department. The engaging of personnel alone is a highly specialized function. It cannot be regarded as incidental to supervision. The discharge of personnel, again, if we are to regard the worker as something more than a cog in the machine, cannot in justice be left wholly to the will of individual foremen." One must always allow for honest differences of opinion, but I wish I could feel that the opinions of men who have not yet come to this conclusion emanated from brains like Oliver Sheldon's working full time on management problems.

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[3] The reading of this book and the recently published *Life of Frederick Taylor* by Copley should be considered an inescapable duty and pleasure by every man who views his business as a profession.

From much observation and experience I can say, however, without fear of my statement being disproved, that where such departments have failed it has usually been due to the fact that chief executives have regarded their chief function to consist of recruiting and hiring workers as a matter of recruiting and hiring only. There has been in such cases, no envisaging of an employment department whose duties add to intelligent selection and placement the kind of follow up of workers which makes both the followers and the followed more intelligent in the future conduct of their jobs.

Taylor himself, in his writings does not give us much concrete help in what he terms "The scientific selection of workmen." In his "Principles of Scientific Management" he speaks of the physiological departments of our universities experimenting to determine the "personal coefficient" of the man tested and speaks of this test proving conclusively that some individuals have unusually quick powers of perception accompanied by quick responsive action. He speaks of Mr. Thompson's excluding, "for the ultimate good of the girls," all girls who lacked a low "personal coefficient." We are given no details as to the method of selecting the proper type of girl for the work under consideration (bicycle ball inspecting).

In the famous story of Schmidt, the pig-iron handler, he says they "watched and studied 75 men for three or four days, at the end of which time we had picked out four men who appeared to be physically able," etc. He then speaks of making a "careful study" of each of these men, which consisted of looking up their histories and making inquiries as to the character, habits, and the ambition of each of them. Schmidt was chosen because he was not only husky but thrifty. Such a method seems extremely unscientific in the light of later day developments. But I think most of us will acknowledge that in an attempt to be scientific during the past ten years, some of our methods of selection have been ludicrously unscientific. Today, happily, a more sensible and moderate procedure seems to be supplanting the over elaboration of a few years ago. We are no longer surveying the topographies of our applicants' faces to discover whether they should heave coal or audit our accounts. No longer do we concern ourselves with the traits of blondes and brunettes since unfeeling investigators have disturbed our pretty theories with facts. We do, however, recognize the value of physical examinations in order to prevent workers from attempting work which might be harmful to them and many of us are experimenting with various forms of intelligence tests. The latter, however, can be of no proven value in a plant where careful and consistent work records of individuals are not kept, for without these there can be no checking up and correlation of tests and work.

Some plants operating under scientific management consider that the most essential qualification of an applicant is his *fitness for the organization.* There are certain prime qualities such as a fair degree of intelligence, perseverance, a cooperative spirit, openmindedness and similar traits which must be present for the building up of a strong, fine-spirited, enduring organization. When people pass muster in these qualifications, placing them on specific jobs is a comparatively simple matter. Many organizations are in a constant state of seething turmoil because so-called "scientific" methods of a hair splitting variety are employed without considering the great essential—fitness for the organization. This by no means signifies the selection of one type of worker. That could not be achieved even if it were desired, considering the wide diversities of human beings. It means merely making an organization analysis before making a job analysis.

One thing is sure. Where Taylor's sound theory of functionalization is consistently applied there is no longer this futile and stupid haggling about who shall do the hiring. It is most depressing to an employment executive brought up in the healthy atmosphere of scientific management to realize that a great many employment managers who have not had the privilege of breathing this bracing air are going through the motions of letting the foremen select their own men. In a plant where the selection of employees is considered one of the clearly defined duties of a functionalized employment department, there is no idle and childish prattle about "authority" in hiring. Such language becomes as obsolete as a piece of antiquated and scrapped machinery. People do not assume autocratic authority in scientifically managed shops. They are governed by the laws and duties which research and scientific study define for them. It is because of that fundamental difference that the foreman in a scientific management shop has to be of an exceptionally intelligent type. He must be capable of distinguishing between the superficial and the fundamental phases of the job of handling people. He knows, if he sees big, that the respect of his workers is not gained by his power to hire and fire. It is gained by what Taylor termed "friendly help," which means not only the intelligent development of each individual to the point of his finest spirit and ability but also the inspiration of group morale. It distinctly does not mean being absorbed with the husks of his job at the expense of the heart of it. When a foreman sees his work in that light he is as impatient of the old time foreman who is jealous of his "authority" as a pilgrim who sees a group of fellow travelers consuming time quibbling about who shall carry the compass when there is necessity for pressing toward their destination.

II. Their Scientific Education and Development

Taylor's third principle, which also has a great effect on the morale of an organization, is the worker's "scientific education and development." Volumes have been written on the training of workers and foremen. It will be the purpose of this paper not to cover methods of training but merely to speak of the subject of training as a fundamental of good management and as a policy which is and must be foundational to effective personnel work.

There are two kinds of training due a worker; one kind relates to the technique of his job and one to the development of his character as worker and citizen. Throughout Taylor's writings we see his emphasis of management's responsibility in training. In the "Principles" he says, "All day long the management work almost side by side with the men, helping, encouraging, and smoothing the way for them, while in the past they stood to one side, gave the men but little help, and threw on to them almost the entire responsibility as to methods, implements, speed and *harmonious cooperation.*"

There has been noteworthy development of systems of instruction in scientific management plants during the past ten years. The usual functionalized instruction division consists of instructors who teach not only new employes but also employes who are promoted to better jobs. The head of the instruction division is usually a man or woman of the highest type, chosen for his technical ability, plus an exceptional capacity for training others. It is his training of the instructional staff and his careful follow-up of their methods and results which has an immeasurable influence on the morale of an organization. The importance of the proper induction of a new worker is self evident. It goes without saying that a worker who gets a wrong start in the technique of his job and in his attitude toward the organization will be of far less value as a producer and as a cooperative member of his organization than if he gets a right start. And it has been demonstrated in numbers of scientific management plants that the right start can be assured only when there are people whose special duty it is to teach. A worried, overworked foreman with a thousand and one other duties cannot possibly add to these duties the proper and effective teaching of workers.

It is a well-known fact that labor turnover is highest during the early months of employment. As methods of teaching new workers, of overcoming the natural discouragement attendant upon learning new tasks, of inspiring the new worker with team spirit and organization loyalty,—as these methods improve, it is possible greatly to reduce this turnover. By firmly believing that the worker in hand is worth two in the bush and making it his business to train and develop this worker to his utmost capacity, an instructor can contribute immeasurably to the prosperity of both workers and management. During the past ten years great progress has been made in methods of training, resulting in eliminating or reducing fatigue, increasing wages, reducing costs, shortening hours and improving plant morale.

It is clear that all the worker now hears about a "chance to advance" are mere honeyed phrases unless management assumes the responsibility of scientific research in discovering best methods of doing work and shares the results of this research with workers. Industry today is too complicated to permit all the manual workers in a plant to do their own experimenting, though any suggestions for improved methods issuing from workers are welcomed. But it stands to reason that, in the first place, the average worker is not of an inventive turn of mind, and in the second place, wages would be low indeed if management shifted responsibility for improving methods to the workers at large. Workers, moreover, appreciate being "shown how" as they frequently testify to their great appreciation of systematic instruction. Ask the new workers in a vestibule school how they like being definitely instructed in how to do their jobs and see how wholeheartedly they praise this method in place of having to "pick up" the work as they frequently have done in their other work places.

Furthermore, it is impossible to have a fair and workable system of promotion without this "scientific education and development" of the worker. It is only human and natural for a foreman directly or indirectly to oppose promoting one of his workers if this promotion will seriously interfere with his production. I am always skeptical, therefore, of an employer who tells me he offers every incentive and opportunity for advancement in his organization unless he also tells me he has a well organized instruction department. Promotions are naturally facilitated by a definite system of training because an instructor can always train a worker to be ready to supplant the person who is to be promoted.

I cannot conceive of a body of workers having esprit de corps and morale unless they see that their successful efforts are rewarded by advancement. And this, please notice, applies to women as well as to men. Many people have applied scientific management methods as far as "the efficient use of men and materials" is concerned, but I have yet to be overwhelmed with many evidences of a broad and generous viewpoint concerning the efficient use of women in the matter of training and opportunity for advancement. A reservoir of pride and competence in workmanship has yet to be tapped when "equal opportunity" becomes more than a pretty phrase.

At the risk of being accused of singing in a monotone I must add that a clearly defined and aboveboard method of training and advancing workers is a most important factor in insuring a sound sense of justice in them. There has been only too much justification of an attitude of suspicion concerning advancement in most organizations. Where the scientific management point of view prevails, workers see evidences on all sides of policy and system taking the place of favoritism in this matter of promotions. This entails a careful working out of relative rates based on a classification of jobs. It also entails utmost publicity as to both the earning opportunity accompanying each job and the rating of individuals holding these jobs. In places where rates are accessible to all there is a complete elimination of rumors and underground currents of distorted facts which are rife where rates are surrounded by secrecy. It may be added that there is no comparison between the sense of fairness which prevails in a plant where the relative value of jobs is a matter of common knowledge and the place where people are refused such knowledge. During the past ten years there has been notable advance in our plant in the matter of classifying jobs on the basis of the skill and effort they require and their comparative value to the organization, and in working out an equitable system of wage payments based on the relative rating of these jobs whether manual or clerical.

Let it be understood that in this matter of classification it is most important that management have a picture of the rungs of the ladder. To draw such a picture in order that it may be set clearly before the organization, the same process of analysis and study is involved as in other phases of scientific management.

Among the phrases which are frequently used with a hazy conception of their full significance is "participation in management." I wonder if the users of this phrase can suggest a better way of assuring such participation than by furthering means of rating jobs and the abilities of individuals to fill them, accompanied by opening the gates of opportunity to those who qualify for such participation. A works council and the privilege of voting do not by any means insure "participation in management," though they are valuable from an educational viewpoint. There must be a constant effort to discover people capable of promotion and the offering of opportunity to them in the way of filling executive positions from the ranks.

But training and advancement are not essential in the case of operatives only. Let us see what Taylor has to say concerning the training of foremen.[6] In his "Principles" we read, in his keen analysis of the failure of a certain firm to install scientific management, "Unfortunately the men who had charge of this work did not take the time and the trouble required to train functional foremen, or teachers, who were fitted gradually to lead and educate the workmen. They attempted, through the old-style foreman, armed with his new weapon (accurate time study) to drive the workmen, against their wishes, and without much increase in pay, to work much harder instead of gradually teaching and leading them toward new methods." Here in a nutshell is the trouble with many plants. We hear much about foreman training which in a large number of plants consists of a series of lectures and discussions conducted by some foreman training agency. This is good, as far as it goes. But it does not go far enough. Nothing can relieve management of its duty in the training of its own foremen. What Taylor terms the "side by side" working of management with men is doubly essential when it comes to the clear, first-hand enunciation of policies and principles by management to foremen. When a manager gets to the point where he expects his foremen to clarify and explain organization policies to workers without realizing his own responsibility in the enunciation of these policies he is taking too much for granted. Here, too, men who are astute enough to pierce the wisdom of Taylor's philosophy do not attempt to pass the buck and lighten the load of their own responsibility. The applied philosophy of scientific management *makes managers work.* Witness what Taylor says in this connection: "The writer is one of those who believe that more and more will the third party (the whole people) as it becomes acquainted with the true facts, insist that justice shall be done to all three parties. It will demand the largest efficiency from both employers and employes. It will no longer tolerate the type of employer who has his eye on dividends alone, *who refuses to do his full share of the work* and who merely cracks his whip over the heads of his workmen and attempts to drive them into harder work for low pay. No more will it tolerate tyranny on the part of labor which demands one increase after another in pay and shorter hours while at the same time it becomes less instead of more efficient." As for demanding effort of management in training leaders Taylor says in his introduction to "The Principles of Scientific Management": "In the past the prevailing idea has been well expressed in the saying that 'Captains of industry are born, not made'; and the theory has been that if one could get the right man, methods could be safely left to him. In the future it will be appreciated that our leaders must be trained right as well as born right and that no great man can (with the old system of personal management) hope to compete with a number of ordinary men who have been properly organized so as efficiently to co-operate."

As members of an increasingly exacting public we wish to be sure that the *principle of training* is carried out in both public and private enterprises which concern our pocketbooks. Those of us who are personnel workers should have an especially keen interest in training because it is one of the pillars of healthy industrial relations.

IV. Intimate Friendly Cooperation Between the Management and the Men

And now we come to the fourth and last principle as laid down by Taylor,—"intimate friendly cooperation between the management and the men." The term "enforced cooperation" is one of those unfortunately crude phrases which have been lifted out of their context and quoted to Taylor's detriment. If his detractors had been fair they would have quoted such phrases as "gradually teaching and training," "friendly help," "management side by side with men" and "one man after another should be tactfully changed over." He much resented the fact that "those men who have the greatest influence with the working people, the labor leaders as well as many people with philanthropic feelings who are helping them,—are telling them that they are overworked," and yet in speaking of pig iron-handlers he said, "If this man is overtired by his work, then the task has been wrongly set and this is as far as possible from the object of scientific management." This was the straightforward, clear thinking, outspoken man who did not mince words when it came to the facing of responsibility by both management and men.

It goes without saying among us personnel workers that it is this kind of thinking and talking on the part of management which commands the respect of workers and automatically secures their cooperation. With Taylor, we may almost say that inasmuch as one cannot resist fair dealing, cooperation may be said to be enforced by it. But let no one think that Taylor believed cooperation to be such a tangible and concrete thing as to be capable of installation at will, like time study. On the contrary, he sorely deprecates what he terms "the wrong spirit" in some people who use the mechanisms of scientific management and urges that "complete revolution in the mental attitude" of managers and men. Cooperation, indeed, is the result of an honest application of the other fundamental principles of scientific management plus "the right spirit."

This "right spirit" is a difficult thing to define. Simply and concretely it has been clarified by Taylor himself when he said, "It is difficult for two people whose interests are the same and who work side by side all day long to keep up a quarrel." And so those of us who are fortunate enough to work in scientific management plants find it. Where management is alive to its responsibilities and considers its practise a profession, where "a fair day's work" is a matter of scientific investigation and not Sunday School sermonizing, where leadership is based not on might but on right which in turn is based on facts, there we find cooperation in flower. As Sheldon says, in such a plant "Management instead of being a law unto itself, has found that there are laws which it must itself obey."

It is fully recognized that cooperation is essential between departments as well as between management and men. No organization can function successfully unless the sales and advertising, the financial, the manufacturing, the designing and all the other departments understand the full significance of cooperation and of putting organization policies above selfish and individualistic expedients. Progress will be impeded just to the degree that any department head does not recognize organization policies as more vital than his own. And each department head must consider his job not only from the point of view of the consumer but also from the point of view of the effect on plant morale of sales methods which insure as smooth as possible a flow of orders, routing methods which insure a continuous and *fair* flow of work, and planning methods which show an intelligent understanding and coordinating of manufacturing and sales. These are examples of devices of scientific management which have been largely developed during the past ten years and which are demonstrating as time goes on that industrial relations are subtly but vitally affected by technique of management. As an example of the effect of a scientific method of routing of work on the spirit of workers I might mention the difference between the plant in which I am now working and the various garment trade plants in another city where I had over two years' experience in placing girls in the needle trades. Many of the bitterest complaints of the girls I placed arose from the jealousies between workers incident to a hit and miss way of distributing materials to them. A girl in a white goods factory would complain that the girl next to her was "a favorite of the foreman and got all the easy work" while she insisted she was "the goat." Even in cases where, on investigation, I felt convinced in my own mind there was no favoritism shown I had no way of proving this to the worker. It was not enough to say, "Your foreman seems to be a fair-minded fellow"; but it would have cured the heartache had I been able to say, "There will be a system of distributing work to you which will insure a fair deal to all." In our own plant complaints concerning such matters vanished when a system of routing was introduced which eliminated any possibility of favoritism and hence any suspicion on the part of the workers. Here is an example of the fact that the presence of a "good heart" is not enough in the mind of the worker. He must be assured of the proper functioning of the good heart.

That is why it is inevitable that the man who "organizes for good will" pays unremitting attention to minimizing the unsteadiness of employment, to establishing a fair method of payment with no secrecy concerning the classification of rates based on the relative values of different jobs, to proper planning and routing methods, to the upkeep of machinery and equipment and to other matters vitally affecting the worker and his work. For all these matters are of vital import to any sound industrial relations policy. We have witnessed many pathetic failures of personnel departments in plants where these principles of plant management are not considered the basis of plant spirit.

Without disparaging the value of such obvious demonstrations of "interest in workers" on the part of management as rest rooms, recreational facilities, cafeterias, libraries, etc., it is becoming more and more evident that workers are expecting more of management in the technique of its job. The plant manager who thinks he is ingratiating his workers by merely giving them pleasant surroundings and then neglects the fundamentals of plant management is like the fond parent who tells all the neighbors how good he is to his little Willie because he gives him a pretty bedroom and nice clothes and then neglects little Willie's teeth and refuses to educate him. Little Willie may be temporarily happy but woe be unto the fond parent when little Willie wakes up. He will frankly tell his fond parent that the pretty room and the nice clothes were all very well and that every parent should attempt to give his son such things if he assumes the responsibilities of parenthood, but that other things were due him also—things of vital import to his physical and mental development. Workers are becoming more and more intelligent concerning the factors, both seen and unseen, which contribute to their earning opportunity and future development and employers will not indefinitely be able to hand out cant concerning vague and abstruse reasons for low wages and wage reductions when workers are cognizant of the shortcomings of management in the essentials of a good organization. One of the healthiest signs of mental activity in workers today is the demand that managers know how to manage.

And it is because of this insistent demand which I first heard so forcefully stated by Frederick Taylor himself many years ago, that personnel work must of necessity be inextricably bound up with every phase of plant management if industrial relations are to be on a sound basis. For every single act of every single operative and every single executive in an industrial plant has a distinct effect on both the individual and group directly affected and on the individual and group indirectly affected. And a personnel department, if it pictures itself as a tool or a coordinating factor in an organization, can accomplish a real job in the acceleration of a unified policy and a fair deal for all. This it distinctly cannot accomplish, however, unless the management, too, has sufficient imagination to see this picture and to encourage the use of the co-ordinating tool.

There can be none of the shiftiness of the opportunist about personnel work which is the outgrowth of the sound principles of Frederick Taylor. It has been my privilege to examine into the methods of many employers during the past decade and to talk with workers from plants where there is a science of management and with those from rule of thumb plants, and I am more and more convinced that cooperation and confidence of workers can not be secured by employers whose labor policies shift with good and bad times. It is safe to make the statement that it was precisely because Taylor's policies and philosophy were based on consistent fairness and justice at *all* times that we find a spirit of confidence in management among the workers in scientific management plants whose basic labor policies coincide with those of Frederick Taylor. If a method of doing the work is good at one time it is good at all times. If it is merely a pretty frill that is good to look at but has nothing to do with the strength of the warp and woof of the organization there is no justification for its existence at *any* time. For Taylor's ideas were fundamentally sound and economical production was to him sine qua non. Those who have built consistently on the foundation he laid have therefore adhered to his policy of building surely and firmly for the future, installing only those methods which are sound and therefore economical in the upbuilding of an organization. Nothing is more economical than to establish machinery which will develop a body of healthy, prosperous, intelligent workers.

For what, after all, is the raison d'etre of a personnel department? Its function, as repeatedly and insistently defined by Richard Feiss, is the maintenance of personnel. This is just as vital to the existence of an organization as is the maintenance of machinery. It involves the keeping of all positions filled with the best fitted and most cooperative personnel obtainable. Such a conception of the function of a personnel department is not predicated on the theory that labor is a commodity. It simply means that the proper maintenance of labor requires as scientific and responsible an approach, as complete and thorough research in its field, as does the maintenance of machinery in a quite different field. Machines are sensitive to the touch of an expert. How much more sensitive, then, are we human beings and how much more important is it that our motives, ambitions, abilities and all the other factors which make us the complicated creatures we are, be studied with care and insight and that we be handled, also, with the touch of an expert.

But expertness in handling us, whether we are operatives or executives, must not be the exclusive art of any one department or any one executive. Unless personnel work is considered the very backbone of the job of all those in supervisory capacities it is a poor and feeble makeshift in an organization. The personnel worker is a mere coordinator; policies may be enunciated and subscribed to, but the duty still remains to see that they are interpreted consistently and without favor and that the machinery which is set up to insure a fair deal, equal opportunity and a consistent organization viewpoint, is kept oiled and in motion. It is only when human beings are working in healthful and pleasant surroundings, with opportunity for their individual development, with frankness and justice and democracy ruling in place of secret diplomacy and whim and autocracy that their work can be ably performed and their minds and bodies fit in the performance of it. It is in this sense that we repeat that the function of a personnel department is the maintenance of personnel.

Some managers find it easy to attribute the failure or imperfect functioning of their personnel departments to the shortcomings of personnel executives. Sometimes this is a fair analysis of such a situation. More often it is not. More often failure is due to lack of imagination and ability on the part of the manager himself. In too many cases which have come to my notice, managers have not so drawn their designs as to weave personnel work into the very warp and woof of the entire fabric. In such cases, because of the sensitiveness and complexity of modern industrial and business organizations, the threads of the loom are tangled instead of the pattern being enhanced. Let the constant reiteration of Taylor concerning scientific management that the man on top must know what it is all about, have due weight with the manager who would install a personnel department. It would be amusing if it were not tragic to observe the naivete of the manager who expects to get a hand-me-down, ready-made "industrial relations man" all trained for one of the most delicate jobs in the world. Sometimes he gets him. More often he doesn't. In any case a manager cannot in all cases shift responsibility from his own shoulders for the failure of personnel work in his plant. The designer is after all the designer and he cannot expect other people to take the blame for failure when his pattern has been wrong, even though the weavers have woven it with conscience and skill.

It may seem a far cry from present day personnel work in scientific management shops to Taylor's fundamental principles, but I assure you it is not. For I am convinced more and more, as I observe various organizations, that the more effectively we can translate into a living, every-day practice these four basic principles which Taylor so clearly enunciated years ago, the more nearly we shall approach justice in industry. But we must keep constantly in mind Taylor's admonition not to separate the handmaidens, spirit and mechanism. For without ideals we perish and without mechanisms for furthering and insuring the carrying out of ideals, we are but clumsy plodders.

In closing we cannot refrain from once more quoting the man whom we consider to be directly or indirectly the inspiration of what is sound and enduring in the personnel policies of present day industry and whose basic philosophy will endure whatever economic system the future may bring and whether "Capitalist Civilization" stands or falls. We can conceive of no future system which will not require justice and fairness between management and men. Said Frederick W. Taylor: "And the time is coming when all great things will be done by that type of cooperation in which each man performs the function for which he is best suited, each man preserves his own individuality and is supreme in his particular function, and each man at the same time loses none of his originality and proper personal initiative and yet is controlled by and must work harmoniously with many other men."[4]

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[4] Principles of Scientific Management, page 140.

THE best way to secure cooperation and team-play is through some man with qualities to lead in the right direction. This man must be found and put in a position to lead; though to exercise his influence he need not necessarily be at the top of the organization, but merely in a position where he may radiate leadership toward the goal of the enterprise. Successful enterprises have such men within their organizations. If the leader be properly placed in the organization, the other executives and subordinates will work harder, more wholeheartedly, and in a more sustained manner for the purpose at hand. One of the best examples of this type of leadership which was ever known was to be found in the person of Mike Murphy, track coach and football trainer at the University of Pennsylvania. Although he was not head coach of the football team but only trainer, candidates for the team would be heard time and time again to say that they were "doing it for Mike" or "backing up Mike." (Lansburgh, *Industrial Management,* p. 44).

ARRANGING an organization should be looked upon more as a game like chess and less as a game like checkers. Frequently men have been moved across the board of the industrial game as if they were all of equal value, as if one could readily replace the other, as if one could always fit into an organization niche when another had gone, merely because he was a man of approximately the same salary or had previously performed approximately the same duties. Men are of different values and work together in different ways. They fit into the team-play in various ways. Men are not square pegs or round pegs to be fitted into square holes or round holes, as is frequently said. The concept that a job is of a particular kind and that it is necessary to find a man to fit that job is frequently wrong. It is more frequently necessary to consider the man who is available and then draw the outlines of the job to fit his capabilities. (Lansburgh, *Industrial Management,* p. 43).

Recent Section Meetings

Central New York Section, January 11. Edgar D. Sebring, Secretary of the New York Southern Tier Section on "The Unemployment Problem"; Helen E. Ploeger, Supervisor of Personnel, The Joseph & Feiss Company, on "Methods Used at the Clothcraft Shops to Provide Continuity of Employment." These papers will be printed in later numbers of the BULLETIN.

Chicago Section, December 20. Round Table Discussion of the "Tie-up of Master Plans with Departmental Plans." February 13. Joint meeting with S.I.E., Management Division of A.S.M.E. K. K. Bell, President of the Calumet Baking Powder Company on "Advertising as Related to Management."

December 17 friends of Hugo Diemer, Chairman of the Chicago Section, held a dinner in honor of his promotion to Colonel, U. S. A.

Cleveland Section, January 28. Douglas Mercer of Pittsburgh on "Distribution as a Governing Factor in Production." This paper will be printed in a later number of the BULLETIN.

New England Section, January 17. Joint meeting with Industrial Relations Department of the Associated Industries of Massachusetts and Boston Chapter of the Society of Industrial Engineers. Charles E. Bedaux, of Cleveland, on "Increasing Production Through Wage Incentives." Willard E. Freeland, Massachusetts Insitute of Technology on "Perfecting and Standardizing the Job." Open discussion led by Carle M. Bigelow of Cooley & Marvin Company.

February 14. Special meeting at the Dennison Manufacturing Company Plant at Framingham. 3:00 P.M. Inspection of (a) Planning and Control Methods; (b) Personnel Work; (c) Manufacturing Departments. Evening program: address by Henry S. Dennison and general discussion of works committee operation and of other matters relating to Dennison management.

New York City, February 14. Joint meeting of New York Sections of Taylor Society, Society of Industrial Engineers and Management Division of the A.S.M.E. Dr. Henry C. Link of Lord & Taylor on "Intelligence Tests in Industry."

New York Southern Tier Section, February 13. "Production Control with Particular Reference to Graphic Production Control vs. the Card System."

Philadelphia, January 25. Percy S. Brown on the "Organization and Management of the Corona Typewriter Company."

Future Section Meetings

Central New York, February 26. Joint annual meeting with the Central New York Purchasing Association. Address by H. H. Melville of Air Reduction Sales Company, New York City and a film on "Oxygen the Wonder Worker."

Cleveland, February 25. Percy S. Brown of the Corona Typewriting Company on "Planning—Maintenance of Proper Inventories, Use of Plant Equipment and Regular Turnover of Capital." March 24. Whiting Williams on "Personnel Problems."

Reviews

Personnel Management: Principles, Practices, and Point of View. By Walter Dill Scott and Robert Clothier, A. W. Shaw Co., Chicago, 1923, pp. xvi, 643.

This volume represents a very careful and thoroughgoing analysis of modern personnel method and technique. It carries through in an admirable way an exposition of what is perhaps the best in personnel practice. The clear and logical presentation of the great mass of detail is to be commended.

The importance of the proper adjustment of the individual to his work is rightly emphasized and the need, construction and use of the "occupational description," "qualification card" and "personnel control chart" is gone into with great detail in several chapters. Those chapters on the general aspects of personnel procedure are well done. The chapters and the appendices on labor turnover and the complete bibliography at the end of each chapter make the book especially valuable to students of personnel management problems.

The chapter on mental alertness tests shows at length various tests and charted results, but it is to be regretted that so little attention is given to the ground work necessary before embarking on a career of mental alertness testing. The statement that "tests can be given by an intelligent clerk after a few hours of instruction" is open to question. A standardized method of giving tests and a particular measurement of the productivity of the individual are essential if correlations are to be of value.

It is disappointing that the book gives so little that is stimulating and enlightening on the philosophy of personnel management. The authors have missed an opportunity to clear up much hazy thinking on personnel management in its relation to other functions of management and the administration of a business enterprise. The mechanics and technique so well presented here are of value, but only when springing from a point of view gained in the study of the fundamentals of sound management and organization—a point of view sadly lacking in many personnel executives and in more plant managers and chief executives.

It is surprising too that the authors have failed to acknowledge the extent and value of the contribution scientific management has made to the field of personnel management.